RAILROAD GAZETTE

FRIDAY, MAY 19.

Contributions.

Papers on Painting.*—No. 4.

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As it is necessary to use very frequently some of the terms defined in the first installment of these articles, but which readers may not remember, we repeat below a part of the "Little Dictionary" then published:

Glycerine.—To be had of your druggist. It is made from oils and fats.

Glycerine Ether.—Glycerine as it exists in oils, united with an oil acid.

Oil Acid.—An acid which when linked with glycerine ether is known as an oil.

Oil.—An oil acid linked with glycerine ether, and from which glycerine and soap can be made.

Soap.—An oil acid linked with soda, potash, lead, zinc, iron or some such substance. Some soaps do not dissolve in water.

Free Oil Acid.—An oil acid unlinked from glycerine ether, but not united with another substance.

Flying Oil Acid.—An oil acid which becomes lighter than air (due to action of heat or light) and flies away as would a gas.

DRYERS OF DRYING OIL.

Oil dries by taking up oxygen from the air, the result being an elastic varnish. With pure oil, however, this takes place only under the influence of light or heat. Light is the first and most important drier of oils, heat is only second to it; both are drying forces.

There are, however, many *substances* which act as driers, and some as anti-driers, as the following experiment will show:

The following substances were painted with linseed oil, linseed oil and white lead, and linseed oil and zinc white; the drying in each case being in the number of days indicated by the figures:

TABLE No. 9.

	Linseed oil.	Linseed oil, white lead.	Linseed oil, zinc white.
Copper	5	2	2
Brass	2	2	3
Zinc	3	3	4
Iron	3	3	3
Lead	1	2	1
Varnished porcelain	4	5	4
Not varnished porcelain	3	3	4
Glass	3	3	4
Plaster	4	3	4
Panel of poplar wood	9	5	10
" fir "	15	9	9
" oak "	159 for 3 coats.		....

This experiment was made by the French chemist Chevreul, a most skillful man. He was specially interested in the quick drying of oil over lead and the slowness of its drying on a panel of oak. He found it would dry somewhat faster upon the bright lead (scraped lead) than upon the dark surface or lead rust which usually coats the surface of this metal.

TABLE NO. 10.

	On scraped lead.	On dull lead.
First coat.		
May 19, at 1 o'clock	Linseed oil	Linseed oil.
" " " 3 "	Set	Fresh.
" " " 5 "	Nearly dry	Set.
" " " 6 "	Dry	Set.
" " " 8 "	Perfectly dry	Nearly dry.
" 20 " 9 " a. m.		Dry, but tender.
Second coat.		
May 21, at 8 o'clock a. m.	Fresh	Fresh.
" 22 " 8 " "	Beginning to dry.	Beginning to dry.
" 23 " 8 " "	Nearly dry	Nearly dry.
" 24 " 8 " "	Dry	Dry.

The first coat dried in a few hours, the second coat in five days. The difference was due to the lead with which the first coat of oil was in immediate contact.

Lead and Oxygen.—We cannot give the reason why oil on the lead dries faster. But we know what occurs when bright lead is exposed to moist air, especially if an acid is present. It quickly becomes linked with the air oxygen. The black film which was scraped from the lead was a thin coating of oxide of lead. The pure lead has a strong liking for oxygen, and will even take fire if very finely divided and thrown into the air.

When lead is heated it takes up oxygen from the air and becomes

		Parts
Yellow Lead	Oxygen about	4 to 7
	Lead	93
		100

If this yellow lead is melted, it becomes litharge. If heated to 600°, it becomes red lead, which is a compound of yellow lead and another lead which contains twice as much oxygen.† These changes come by taking up oxygen from the air under the influence of heat, and therefore resemble the drying of oil.

The Oxygen of Driers.—Curious substances have been mixed with oil, as driers: bread, onions, garlic, etc. Mulder likens them to the mixtures in a witch's cauldron. It is evident why lead compounds, especially litharge and red lead, act as driers; when they are heated they give off oxygen and become to the oil like concentrated air. Other metals also unite with oxygen—iron, zinc and manganese. The following table shows the drying of warmed linseed oil, and a mixture warmed for two hours of oil and iron paint (oxide of iron), oil and litharge, oil and red lead, and oil and zinc (oxide) white.

There are two objects to be accomplished by these tables: 1, to show in the plainest figures the effect of the driers on oil; 2, to make the painter more familiar with what a long process "drying" is. The figures are easily understood, those marked with * being losses, the losses and gains being added together at the foot. After the net gain is given, the oil is warmed by 176°, and the loss stated is that caused by the flying away of the soft, non-drying acids, which have been changed into rancid acids by the oxygen of the air. Finally, a table of percentages of gain and loss is given. The oil was weighed each day.

TABLE NO. 11.

	Warmed oil. Grams.	Iron oxide and oil. Grams.	Litharge and oil. Grams.	Red lead and oil. Grams.	Zinc white and oil. Grams.
April 28.	1.389	1.961	3.549	2.407	2.576
" 29.	nothing	nothing	0.122	0.195	nothing
" 30.	"	"	0.028	0.028	0.007*
May 2.	.008	"	0.015	0.015	nothing
" 3.	.011	"	0.011	0.004	0.032
" 4.	.012	"	0.007	0.002	0.050
" 10.	.144	0.026	0.010	0.006	0.197
" 14.	.010	0.166	0.012	nothing	nothing
" 21.	.012*	0.012	0.012	0.010*	0.009
" 28.	nothing	0.006*	0.014*	0.014*	0.005*
June 4.	"	0.005*	nothing	0.002*	0.005
" 11.	"	0.007*	0.008	nothing	nothing
" 18.	"	0.004*	0.004	"	"
July 26.	0.009*	0.010*	nothing	"	"
Gain	0.185	0.204	0.329	0.250	0.293
*Lost	0.021*	0.032*	0.014*	0.026*	0.012*
Net gain	0.164	0.172	0.315	0.224	0.281
Heated, there was lost	0.047	0.069	0.067	0.086	0.139
	0.117	0.103	0.248	0.138	0.142
		Percentage (by weight of oil).			
Net gain	11.9	11.4	12.5	13.2	12.6
Loss by heating	3.5	4.6	2.6	5.0	6.2
	8.4	6.8	9.9	8.2	6.4
	Amount of oil in each paint.				
	Grams. 1.389	Grams. 1.511	Grams. 2.512	Grams. 1.695	Grams. 2.235

The well-known slowness of drying of zinc white and of iron oxide paint are plainly shown by the table. Iron does not to any extent give up oxygen to the oil. The litharge and red lead paints, however, immediately give up a large amount of oxygen, and we observe that the litharge gained nearly 5 per cent. (of the weight of its oil) in oxygen, and the red lead over 11 per cent. on the first day. The iron oxide paint and zinc oxide paint gained nothing for many days.

Black manganese and umber are both used in drying oil. They both contain the metal manganese linked with oxygen gas. Umber is composed of manganese and oxide of iron; black manganese contains about 37 parts of oxygen.

Some experiments by Chevreul show very plainly the powerful drying properties of manganese and litharge, and also the singular fact that where a large quantity of drier is used and settled from the oil, it acts a second time with greater power when boiled with oil.

TABLE NO. 12.

1. Linseed oil boiled 5 hours.. ..... 38 days in drying.
2. Linseed oil boiled 5 hours, with new peroxide of manganese..... 2 days in drying.
3. Linseed oil boiled 6 hours, with peroxide of manganese which had been used many times before..... ½ day in drying.

Another singular fact came out in Chevreul's experiments. He compared the power of an oil boiled with manganese with a mixture of this oil (so boiled) with 156 parts of pure oil. He found that the mixed oil—which, of course, contained much less drier*—absorbed much the most oxygen from the air, as will be seen by the following table:

TABLE NO. 13.

Volumes of Oxygen absorbed by Oils.

	Pure oil. No. 1.	Boiled oil. No. 2.*	Mixed oil. 156 parts of No. 1. 44 " No. 2.
Oxygen taken up in 3 days.	1.81	0.30	3.26
" " 9 "	1.77	3.00	8.95
" " 18 "	2.18	6.75	19.73
" " 30 "	2.54	21.45	30.82

This experiment was made by exposing the oil to oxygen gas, and it shows that driers not only give up to the oil such oxygen as they may have, but that they continue to take oxygen from the air and give it up to the oil. Umber and manganese act in this way. The reason for heating them with the oil is that they both take up oxygen from the air and give it more rapidly to the oil when heated than when cold.

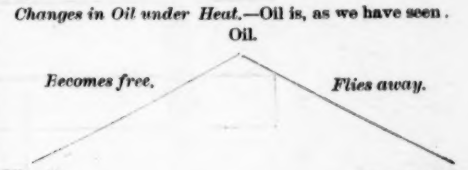
BOILING OIL (WITHOUT DRIERS).

C. W. Vincent (of London) has had a very large experience in boiling oil for printing inks, and has made many experiments with it. He states that a body of oil heated so that no air reaches it except on the surface, as in heating in a common kettle—such oil heated for several days becomes thicker, more greasy, and has decidedly less drying power.

He also states that of many hundreds of samples of oil taken at various stages of heating and boiling, not one dried more rapidly than a sample of raw oil from which it had been taken.

If oil is heated in the air it certainly, as we have seen, takes up oxygen more rapidly; why then should it not dry more rapidly after heating for many hours, or even several days? These facts show the need of a close study of our subject.

Changes in Oil under Heat.—Oil is, as we have seen,



When oil is heated to 176° it begins to unlink, the glycerine separating from the oil acid and flying away. Some oil acid is thus left free, so that a heated oil is soon a mixture of oil and free oil acids.

As we have seen, these free oil acids, *i. e.*, acids unlinked from the glycerine, dry very slowly. They take up oxygen and increase in weight, but they remain as sticky oil acids for a long time. Free oil acids unite with lead or iron or manganese, and form soaps. Driers, therefore, not merely give up oxygen to the oil, but they harden it by changing the free oil acids into soaps.

These soaps, which are formed by the linking of oil acids with the driers, become very hard as they dry, but they also become *brittle*. Oils are injured by driers if too much of these soaps exist in the dried oil.

Raw Linseed-oil Soaps.—Potash, soda and ammonia soaps of linseed-oil acid dissolve in water. Other soaps do not. Barytes (sulphate of baryta) does not form soap when mixed with the oil. Carbonate of baryta and lime soaps become quickly red in the air. Whiting gives little, if any, soap with linseed oil, at least not for a long time.

Verdigris forms a soap which tends to become dark with time. Zinc forms soap very slowly, and its soaps do not quickly change in color.

The most important soaps are lead soaps, which will be further spoken of. Iron soap tends to yellow.

Mixed with raw oil more soap is formed by some substances than others.

Linseed oil contains glycerine ether	8 parts.*
Potash sets free of " " "	6 "
Lead " " " "	4 "

or only one-half. Lead apparently changes only one-half of the oil into soap.

All linseed-oil soaps dry more quickly—much more quickly—than the free oil acid unlinked from the glycerine ether. *One reason of this is because the free not-drying oil acids are hardened by becoming soaps. One-fifth of the oil consists of soft not-drying oil acids.*

Boiled-oil Soaps.—Lead, manganese and zinc and other substances give more soap in boiled linseed oil because it contains an abundance of free oil acids. These are hardened by the soaping and quickly dry into hard, brittle substances. Red lead gives the hardest soap.

To sum up the action of driers, they probably act in three ways:

(1.) By giving up oxygen to the oil, which also loosens the oil acid from the glycerine ether.

(2.) By forming soaps with all free oil acids, and hardening them. These are the soft not-drying acids, and the sticky oxy-linseed oil acid.

(3.) By continuing to take up oxygen from the air, feeding it to the oil. This is certainly true of manganese; but probably not to any extent of lead which is not heated. It is possible that manganese driers harden the oil more by feeding it oxygen; lead driers by making more of its acids into soap. If this is the case, it is an important fact in the wearing of the oil, which will be discussed by and by.

Tracy's Safety Switch and Stand.

Ordinary point or "split" switches are usually so arranged that if a train approaches them in a direction opposite to that for entering the turn-out or side track it will move the switch rails in "points," in case they are not set right for the train and change them for the track on which the train is running. This is usually accomplished by forming a yielding or spring connection between the switch-moving rod and the switch; but such an arrangement is said to be objectionable because if any obstruction should get between the switch rails and the main rails, the switch-tender can still completely turn the handle or operate the shifting mechanism and lock the switch without properly placing it, thus leaving the switch only partly set, which would necessarily lead to an accident. The switch and stand illustrated here with have been designed to obviate this defect.

The switch is illustrated in plan by figs. 1 and 2. In fig. 1 it is represented in the position it occupies when set for the side track, and in fig. 2 it is set for the main track.

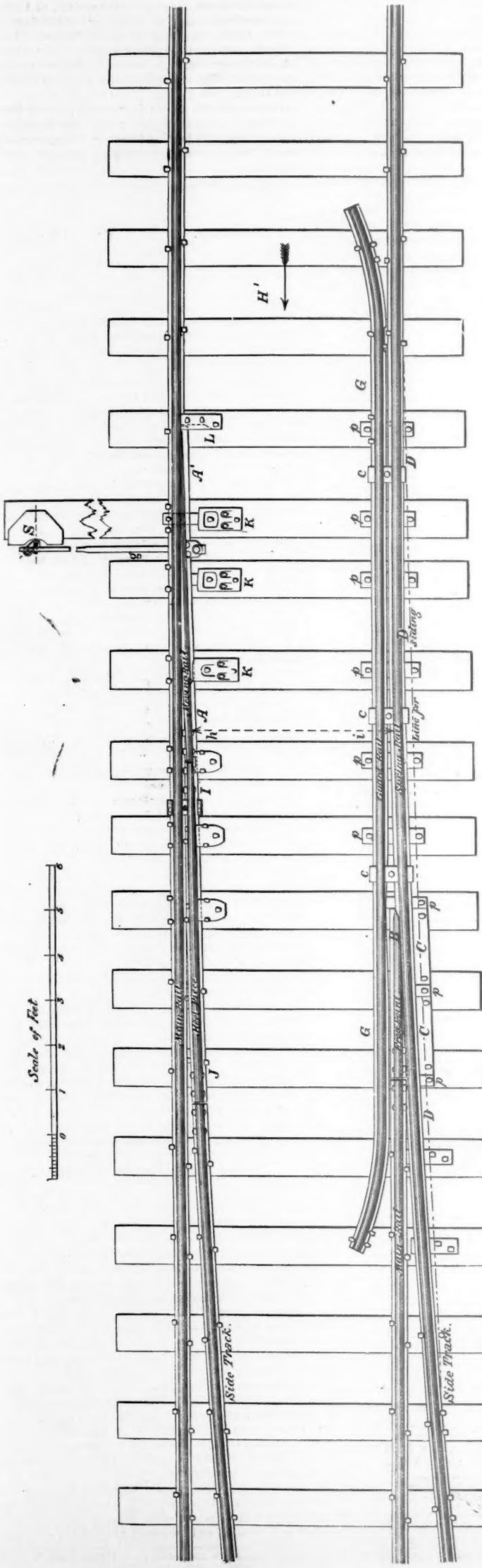
The switch, it will be seen, has but one movable point, *AA'*, which is attached at *A* to the "heel-piece" *IJ* by fish-plates in the usual way. The other point *B* is fixed and is riveted to an iron plate *CC*, which is securely spiked to the cross ties. On the other hand *DD*, or the "spring rail," as it is called, and the guard rail *GG* are fastened to-

* The chemical changes (in oils) now to be studied are less assuredly known. Putting aside the chemical explanation of facts, attention will be fixed on certain general aspects of those which have relations with practice. Statements must, therefore, be taken as scientific light upon practical questions; not as absolute certainties without shades of doubt.

† Red lead contains over 9 per cent. of oxygen.

* The oil boiled with the manganese had already taken up much oxygen; it would therefore be able to take up less. The experiment does not show that more oxygen is taken up when less manganese is used. Table No. 5 (Article 2) shows that oil (with slow-drying zinc white) was in oxygen gas dry in 24 hours. It will be seen therefore that all the oxygen taken up after 24 hours was the over-drying of the oil; and the effect of manganese driers in over-drying the oil is in some degree shown by the above figures.

* These figures are not exact; as far as possible decimal figures are disregarded in these articles.


Scale of Feet
0 1 2 3 4 5 6
Main Track
Side Track
Main Track
Side Track
Main Track
Side Track
Main Track
Side Track
Main Rail
Heel Piece
Main Rail
Heel Piece
Main Rail
Heel Piece
Main Rail
Heel Piece
Switch
Stub
Stub
Stub

gether by clamps *cc*, and are both movable and slide on plates *p*, *p*, *p*, being spiked to the cross ties only at their ends.

When switch is set for the main track, as in fig. 2, it will be seen that the gauge of the spring-rail in front of the fixed point *B*, or in the vicinity of the dotted line *ef*, is somewhat wider than the actual gauge at other points. If, however, a train approaches the switch from the right-hand side in the direction of the dart *H*, the movable rail *AA'* and the heel-piece *IJ* will act as guard rails, so that the inside of the flanges of the wheels, on that side, will bear against these rails and thus carry the flanges on the opposite side towards the guard rail *GG*, and keep them away from the spring-rail and direct them on the right-hand side of the point *B*, looking at it in the direction the train is moving, and thus cause the train to run on the main line.

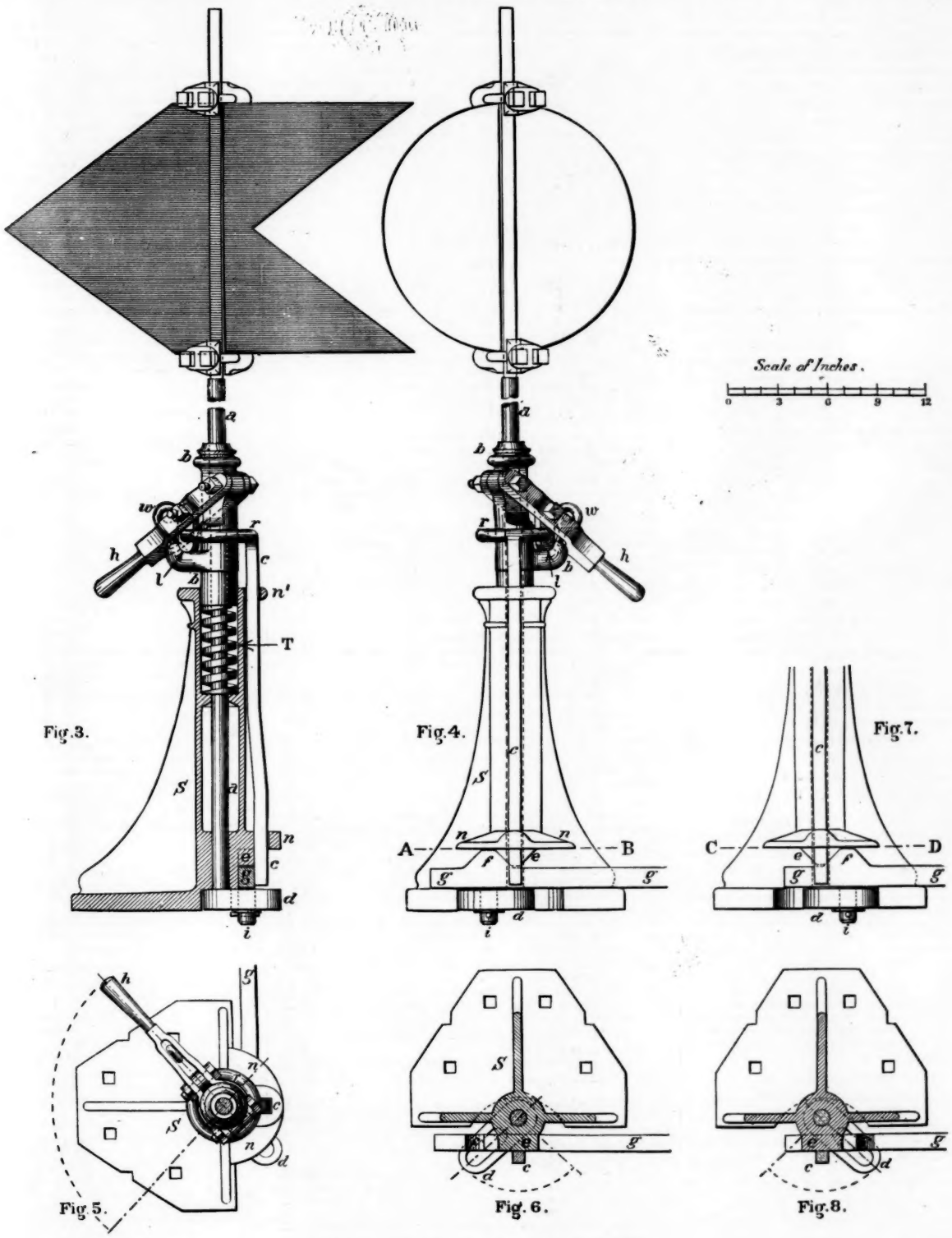
When, on the other hand, the movable rail or point *AA'* is set for the side track, as indicated in fig. 1, then the distance between it and the spring rail indicated by the dotted line *ih* is less by some inches than the gauge of the track. The outside of the flanges of the wheels on the right side of a train approaching in the same direction as before, or as indicated by the dart *H'*, will press against the rail *AA'* and cause those on the opposite side to bear against the spring-rail, and thus move it laterally into the position indicated by the dotted line marked "line for siding" in fig. 1. This rail being fastened to the guard rail *GG* carries the latter with it. The movable rail *AA'* and the heel-piece *IJ* cause the spring rail to be moved so far to the left of the point *B* as to give abundant room between it and the spring-rail for the flanges of the wheels on that side of the track. At the same time these flanges are directed by the heel piece into the space thus opened between the point *B* and the spring-rail, and consequently the wheels are directed on to the side track.

From the description, the action of this switch when a train is approaching it from the opposite direction will be understood. If the switch is set as in fig. 1 and the train on the main track approaches from the left, it will simply spring the movable rail *AA*, away from the main rail, as in any ordinary split switch.

If, on the other hand, the switch is set as in fig. 2, and a train on the side track approaches from the left, its wheel will move the spring-rail *DD* away from the point *B*, so as to give room for their flanges, and those on the opposite sides will press the movable rail *AA*, over against the main rail, as in any other split switch.

The movable rail is operated by a rod *g*, which connects it with a stand *S*, which is illustrated on a larger scale in figs. 3 to 8. There are also cast-iron brackets *K K*, which limit its movement and also form slides on which it moves. The end *A''* of the rail moves in a clamp or slide *L* which holds it securely.

The switch stand is shown in the engravings, figs. 3 to 8, of which fig. 3 is a vertical section through the casting; fig. 4, a front elevation; fig. 5, a plan view (without the target); fig. 6, a sectional plan on the line *AB*, fig. 7, part view of the front elevation, when the switch is reversed, and fig. 8, a sectional plan on the line *CD*. A cast-iron stand *S* supports a vertical shaft *a*, to the upper end of which are attached the switch targets, and to its lower end is welded a crank *d*. The crank is provided with a slot in which moves the pin *i* of the connecting rod *g*. The other end of the connecting rod is attached to the movable rail of the switch, as shown in fig. 1. To the shaft *a* a casting *p* is rigidly attached, by means of a pin, to which is pivoted the handle *h*. The handle can be moved up or down about its pivot without imparting any motion to the shaft, and this motion has been utilized for working the lock. But the handle can also be revolved about the shaft or moved in a horizontal plane, and this motion is imparted to the shaft and consequently to the target and the crank. The two positions of the crank *d*, corresponding to the two positions of the switch, are shown distinctly in figs. 6 and 8. To move the switch from one position into the other the crank *d* describes one-quarter of a circle, as shown by the dotted lines in fig. 5; the pin *i*, figs. 3, 4 and 7, of the connecting rod *g*, is at first forced outward toward the extreme end of the slot of the crank, then it moves in the arc of a circle, and finally is forced back in the slot toward the shaft. It will be presently shown that this whole motion must be accomplished before the switch can be locked. The cast-iron stand *S*, fig. 3, has a projecting cap *n*, directly under which is a triangular lug *e*, the form of which is shown in figs. 4 and 7, all of these being one casting. The connecting rod *g* has a similar triangular lug *f*. Now, looking at the figs. 4 to 8, it will be observed that in either of the two positions of the switch, the lug *F* is either on the left or the right-hand side of the immovable lug *e*; that in order to move the connecting-rod from one position to the other, the lug *F* of the connecting-rod must be moved outward, so as to get out of the way of the lug *e*; and if this outward motion be prevented, the switch will be locked in its position. The locking bar *c* does this when it is in the position shown in the engraving, its lower end holding the connecting-rod *g*, so as to prevent outward motion. If this locking-bar be raised so



STAND FOR TRACY'S SAFETY SWITCH.

that its lower edge will clear the connecting-rod, the motion of the connecting-rod, consequently a change in the position of the switch, will be permitted. The vertical movement of the locking-bar *c* is imparted to it by a similar movement of the handle *h*, already spoken of. The bar *c* is welded to a ring *r*, drawn clearly in fig. 5, the latter being connected to the handle *h* by means of a short link, as shown in fig. 3. The bar *c* passes through holes made for it in the upper flange *n* of the stand *S* and in the cap *n*, to prevent the imparting of rotary motion to it from the shaft, the short link *l*, which connects it with the handle, sliding on the ring. The handle can be secured in the position in which the switch is locked by attaching any ordinary lock to the lock-eye *w*, shown in fig. 3.

It may be here observed that as the switch cannot be locked until the connecting-rod has accomplished its full movement, and the two lugs *F* and *e* are standing side by side (otherwise the locking-bar would strike the top of the connecting-rod), and as the connecting-rod is one solid piece, the switch could not be locked if perchance some obstruction, such as stone or snow, should lodge between the movable rail and the main rail or one of the castings on the track.

It remains to explain the automatic action of the switch. In describing the switch it was shown how the flange of one of a pair of wheels throws the movable rail from one position into the other. The movable rail imparts its motion to the connecting-rod *g*, which is held in position by the locking-bar *c* and the lug *e*. The locking-bar *c* is unyielding, but the lug *e* does not prevent the downward motion of the connecting-rod, the sides of the lugs *e* and *F* being sloped, consequently a pressure through the connecting-rod will force the lug *F* under and to the other side of the lug *e*. With the connecting-rod also the crank and the shaft must receive the downward motion, and to admit of this a spiral spring *T*, fig. 3, is placed around the shaft, its lower end being supported on a flange of the stand *S*, and its upper end supporting the casting *b*, which, as was said, is fixedly attached to the shaft. When the pressure of the flange of the wheel moves the switch rail, and with it the connecting-rod *g*, the inclined surface of the lug *f*, acting against a similar surface at *e*, produces a downward pressure on the crank *d*, which is communicated by the rod *a* to the spring *T*. When the log *f* moves to the other side of *e*, the spring *T* causes it to complete the whole movement of the switch, so that the latter is not left partly open or closed During this operation the crank, the shaft and the handle have made one quarter of a revolution, the same as if the change had been accomplished by means of the handle. After the switch has been thrown automatically into its new position it remains there locked, as if this were done by hand.

These switches are now in use on several railroads where they are adopted, and among others on the New London Northern Railroad, the New York, Ontario & Western and the New York, Susquehanna & Western.

The Ramapo Iron Works, at Ramapo, Rockland County, New York, have secured exclusive right to the patents of this switch, as also the services of its inventor, Mr. D. Tracy, who superintends their manufacture.

On a Producer's Classification of Iron and Steel.

The following article from the German periodical *Stahl und Eisen* is copied as translated from the minutes of the Proceedings of the (British) Institution of Civil Engineers:

The classification of iron and steel proposed by the German Railway Union as a basis for the supply of railway material having given rise to considerable discussion among the producers of such material, a commission for the purpose of drawing up a revised scheme was formed by the Society of German Ironmasters; and at a general meeting held at Düsseldorf on May 28, 29, 1881, was adopted after discussion. The commission deprecated the practice of using the contraction of the fractured area alone as a principal measure of the toughness of the material, and considered that evidence of greater practical value as to this property is to be obtained from the results of the falling weight and bending tests combined. After some preliminary instruction in the method of preparing test pieces, the classification of the test is given as follows:

(I.) TESTS WITH UNDIVIDED OBJECTS.

a. Cold tests. 1, External inspection; 2, hammering; 3, falling weight; 4, direct loading. *b.* Hot tests.

(II.) TESTS WITH SEPARATED PIECES.

a. Cold. 1, Bending; 2, punching; 3, breaking; 4, tensile. *b.* Hot. 1, Bending; 2, punching; 3, forging; 4, welding.

The standards for the different classes of material are:

I. HOMOGENEOUS MATERIAL (STEEL). A. RAILS.

a. Inspection.—As permissible variations in the linear dimensions, ± 3 millimetres in length, ± ½ millimetre in height, and ± 1 millimetre in breadth of flange.

b. Falling Weight.—Tests to be applied to rail pieces that have not been either notched or bored, and whose ends do not project more than ½ metre beyond the bearings. The heights of fall of a weight of 600 kilograms, fixed for rails of different sections, are:

a.	Weighing above	30 kilog.	per metre & about	130 mm.	high,	5 metres
b.	" 27½—30	"	"	120	"	3.25 "
c	" 23 —27	"	"	110	"	2.5 "
d.	" 20 —24	"	"	100	"	2 "

The test-piece, 1 metre long, between the points of support in each case to receive two blows without fracture.

c. Loading Test.—For the different sections and weights given above, the weights to be supported without producing more than ½ millimetre permanent deflection are:

a. 17,500 kilograms; b. 13,500 kilograms; c. 11,500 kilograms; d. 10,000 kilograms.

d. Bending Test.—A length of rail, 1 metre, between the points of support to bend to 50 millimetres over both head and foot without fracture.

B. TESTS WITH PREPARED TEST PIECES.

a. Tensile Test.—Under the assumption that either the contraction of area or the longitudinal extension, but not both, will be used in judging the quality of the material, the commission recommends the following tests:

Bars of 200 millimetres long and 20 millimetres diameter shall bear a minimum load of 30 kilograms per square millimetre, with a contraction of 20 per cent. or an elongation of 12 per cent.

As regards further conditions in contracts for supplying rails, the commission remarks as follows:

1. As limits of toleration in weight, 3 per cent. above and 2 per cent. below the normal amount, and of the excess weight about 2 per cent. should be paid for.

2. As regards maximum length, 9 metres, beyond which very few rolling mills are capable of working, and the risk of damage in transport is greatly increased.

3. About 5 per cent. of the rails shorter than the standard length to be received.

4. The guarantee for rails is fixed at five years, commencing on the 1st of January next following the date of delivery.

5. Rails worn out in regular traffic not to be replaced under the guarantee. The guarantee on rails replaced to terminate at the same date as that on the original contract.

The number of rails reserved for testing not to exceed ½ per cent. of the whole amount.

2. STEEL TIRES.

a. Falling-Weight Test.—To endure three blows of a weight of 600 kilograms, falling 5 metres, without fracture.

Tensile test, with pieces 250 millimetres long and 20 millimetres thick.

1. Locomotive tires. Tensile strength, 55 kilograms; contraction, 25 per cent.; elongation, 12 per cent.

2. Tender and wagon tires. Tensile strength, 45 kilograms; contraction, 35 per cent.; elongation, 18 per cent.

The guarantee of two years not to be extended to tires subjected to the action of brakes, or to those worn out in regular traffic. The toleration in dimensions to be 1 millimetre per metre diameter. The number of tested pieces not to exceed ½ per cent. of the whole.

3. STEEL AXLES.

a. Falling-Weight Test.—To support without fracture, upon a length of 1.5 metre between the bearings, six blows from a weight of 600 kilograms, as follows, the point of impact being changed after each blow:

Two of 4 metres drop; two of 4½; one of 5 metres, and one of 6 metres.

b. Tensile Test.—Maximum strength, 45 kilograms per square millimetre; contraction, 28 per cent.; extension, 15 per cent. Guarantee four years against failure through defective material or manufacture. Number of tests not to exceed ½ per cent. of total.

4. STEEL SLEEPERS.

a. Cold Bending Test.—When flattened by moderately heavy blows of a steam hammer to stand bending round a radius of 75 millimetres to a loop without fracture. This test is only to be used when the form of the sleeper permits.

b. Tensile Test.—As for axles, with 30 per cent. contraction, or 15 per cent. elongation.

Permissible variation in weight, 3 per cent. above and 2 per cent. below standard; and in length, for cross sleepers, 15 metres; for longitudinal sleepers the same as for rails. Number of tests not to exceed ¼ per cent. of the whole, which is that adopted by the Rhenish Railway. Period of guarantee, two years.

5. STEEL FISH-JOINT AND BEARING PLATES.

The tensile strength to be the same as for rails, but having regard to the great variety in the form of these articles in use the general application of other tests does not seem to be desirable.

C. STEEL CONSTRUCTIVE MATERIAL.

As sufficient experience in the use of steel for constructive purposes is wanting, the commission does not consider it possible to recommend any special series of tests. In a general way, a tensile strength of 45 to 55 kilograms, with an elongation of 15 to 20 per cent., may be considered sufficient.

D. STEEL PLATES.

1. *Ship Plates.*—The tests recommended are those adopted by the German navy, namely, a tensile strength of 40—50 kilograms per square millimetre. Annealed plates should bend cold upon a radius equal to the thickness through 180° without fracture. Plates 260 millimetres long and 40 millimetres broad, raised to a cherry-red heat, and cooled in water at 28° Cent., to bend round a radius of 1½ thickness without fracture.

2. *Boiler Plates.*—Tensile strength 38—47 kilograms per square millimetre, with an extension of 25—18 per cent. Plates when soft to bend cold through an angle of 180° upon a radius of half the thickness. When hardened, to satisfy the test given for ship plates.

The above tests are applicable to plates at least 5 millimetres thick; the testing of thinner ones not being considered necessary.

II. WELDED MATERIAL. A. BAR IRON.

1. Rivet (best best) iron.

For this quality a tensile strength of 38 kilograms per square millimetre, with an extension of 15 per cent., is specified.

a. Cold Bending Test.—Pieces cut from flat bars from 30 to 50 millimetres broad, and not more than 16 millimetres thick, and round bars up to 30 millimetres in diameter, should stand bending into a loop whose inside diameter is equal to the thickness of the bar.

b. Hot Test.—When heated the test piece must bear doubling and a piece of round iron two diameters long must bear reduction to one-third of its length without cracking.

2. Horse-shoe, nut, or (best) iron.

Tensile strength, 36 kilograms, with an extension of 12 per cent.

a. Cold Bending Test.—Flat section, not more than 16 millimetres thick, square and round, up to 30 millimetres diameter, to bend without cracking into a loop whose internal diameter is twice the thickness of the iron.

b. Hot Test.—The test piece, of the dimensions previously given, must bear bending into a loop whose inner diameter is equal to the thickness of the iron.

The above values for tensile strength and extensibility can only be held to apply to manufactured objects whose thicknesses are not greater than those given under the cold bending tests. If therefore it is desired to test thicker objects, the test pieces must be reduced to the proper size by forging or rolling. The standard length for test pieces is fixed at 200 millimetres.

3. *Ordinary Bar Iron.*—The commission does not consider it possible or necessary to introduce tests for this class of iron, as the differences between the make in the three principal German iron-making districts are dependent upon the local material employed, and cannot be eliminated.

B. RAILWAY MATERIAL.

1, 2, 3. Sleepers, fish-plates and bearing pieces.

The toleration in weight and dimensions to be the same as that given for steel sleepers. Up to the present time railway managers have not specified any particular quality other than fibrous iron generally. Probably a tensile strength of 34 kilograms, and 10 per cent. extensibility, will be sufficient. Should a cold bending test be required, it is proposed that test pieces 30 to 50 millimetres broad, with rounded edges' should stand bending upon a radius of 13 millimetres as follows:

Thickness,	8—11	millimetres,	50°.
"	12—15	"	35°.
"	16—20	"	25°.
"	21—25	"	15°.

Warm tests of these articles are not considered necessary, as they are never subjected to heating in use. As experience shows that the quality of the material is not affected by punching or notching when cold, this should be permitted. The permissible variation in length to be ± 3 millimetres, and in weight ± 3 per cent. It must be remembered that these articles cannot be sawn hot, as is sometimes required, but must be cut cold with a shearing machine.

4. Small iron material. Bolts, spikes, etc.

Usually a high quality of fibrous iron is specified for these objects. A tensile strength of 35 kilograms, with 42 per cent. extension, should be sufficient. The cold and warm bending tests should be the same as for best iron.

C. PLATES.

The commission considers it sufficient to lay down bending and tensile tests for the three best qualities of plates, leaving it to the consumer and producer to distinguish these by particular names. It is to be remarked that many of the names hitherto used are no longer applicable, for instance, so-called charcoal plates are not now made from charcoal iron, etc. A general recognized classification, which should as far as possible express the quality, is much to be desired. The following are the tests recommended:

(I.) WITH ENTIRE OBJECTS.

Inspection.—Each plate, when examined on both sides, is to be free from blisters, cracks, and other marks of defective rolling; surfaces to be smooth and uniform. In dimensions a variation of ± 10 milimeters in length and breadth. The weight to correspond to that form by calculation to within ± 5 per cent. in single plates, and ± 3 per cent. in larger quantities.

(II.) WITH PREPARED TEST PIECES.

a. Bending Tests.—The hot bending test to be round a square edge; the cold ones round a cylinder 26 millimetres in diameter. The angles through which the plate must bend red-hot are, for—

	No. III.	No. II.	No. I.
With the fibre	110°	150°	180°
Across	80°	120°	180°

COLD BENDING TESTS.

THICKNESS.	No. III.		No. II.		No. I.	
	Longitudinal.	Transverse.	Longitudinal.	Transverse.	Longitudinal.	Transverse.
Millimetres.	°	°	°	°	°	°
6— 7	50	30	80	50	110	90
8— 9	45	25	70	40	100	80
10—11	40	20	60	35	90	70
12—13	35	15	50	30	80	60
14—15	30	12	40	25	75	50
16—17	25	10	35	20	70	40
18—19	20	8	30	15	65	35
20—21	15	5	25	10	60	30

The test is to be considered broken when a visible fracture appears in the metallic iron.

b. Tensile Tests.—The cuttings removed from the dome, manhole or fire-tube plates to be used, where possible. Fire-box and certain shell plates to be ordered 50 millimetres larger than the dimensions required, to allow the test pieces to be cut from them. The choice of length of the rectangular test piece between 150 to 200 millimetres, and of the section between 306—600 square millimetres, to be left to the maker. The values in the following table, in kilograms, are the breaking strain per square millimetre of the original section. The extension is to be measured after fracture. The numbers given for strength and extensibility may vary by one, but the sum of both must be equal to that of the table:

	No. III.		No. II.		No. I.	
	Longitudinal.	Transverse.	Longitudinal.	Transverse.	Longitudinal.	Transverse
Tensile strength. kgms.	33	30	35	33	36	34
Extension	7	5	12	8	18	12 p. c

The values given above are those adopted by the German Steam-boiler Inspection Commission at the meeting at Wurzburg, Feb. 10, 1881.

D. CONSTRUCTION IRON.

By this term is meant the quality of rolled bar iron used in the construction of bridges and other large works.

A. TESTS WITH UNDIVIDED OBJECTS.

1. *Inspection.*—The iron must be properly rolled with smooth, even surfaces, and free from cracks and cinder patches and other surface defects.

2. *Fracture.*—A flat bar, when nicked with a chisel and bent, must show a mainly fibrous structure, except in the case of bolt or rivet iron, where a fine-grained fracture may be required.

All further tests with full-sized objects are to be avoided, either as being inapplicable, or because the information required may more readily be obtained by working upon prepared test pieces. The hot bending test sometimes specified for flat and angle-iron bars, of requiring the full-sized bar to bend hot through a certain angle, is uncertain, as the result depends mainly upon the skill of the operative making it; a good smith may apply it successfully to an inferior quality of material, while an unskilled one may fail with a better class of iron. The existence of red-shortness, which this is intended to detect, may be more readily determined by the hot test upon prepared pieces.

B. TESTS WITH SEPARATED PIECES.

According to its uses, iron for constructive purposes may be divided into the following four classes (I. to IV.), each corresponding to a particular requirement or a particular method of manufacture.

I. For angle and flat bars and plates mainly subjected to strain in one direction.

The plates included in this class are those employed in the tables of girders, tension rods, compression struts, etc.

1. *Cold Bending Test.*—A strip from 30 to 50 millimetres broad must bend, without fracture, round a cylindrical surface of 13 millimetres radius, through an angle varying with the thickness of the plate. These angles are the same as those already given for sleepers and fish-plates. This method of bending is to be preferred to the custom of bending into a loop of large radius more generally practiced, as it may be applied mechanically in a more uniform way than can be done when the result depends in part upon the skill of the operator.

2. *Tensile Test.*—Longitudinal breaking strain, 36 kilograms per square metre; extensibility, 12 per cent.; the test pieces to be from 300 to 500 millimetres long in the extensibilities to be observed upon a length of 200 millimetres.

These figures to apply only to bars whose thickness does

not exceed 16 millimetres. Heavier bars should, as a rule, be avoided for such uses. When it is required to test the material of thicker bars, the test must be reduced to the standars dimension by forging or rolling.

3. *Hot Bending Test.*—Strips of the same dimensions as those of the cold bending test, when similarly treated at a cherry-red heat, must bear through the following angles according to thickness; up to 25 millimetres, 120°; above 25 millimetres, 90°.

2. *Forge Test.*—A strip of a flat or angle bar or plate, cut cold and heated to redness, must extend under the hammer to one and a half times its original breadth, without showing signs of separation in the iron. The radius of the hammer pane to be 15 millimetres.

II. Plates that are subjected to strains in different directions, or mainly to bending strains.

This includes connecting plates, corner pieces, gussets, the web-plates of girders, etc. The cold bending test for these, in the direction of the fibre, is similar to that for the preceding class. Across the fibre the angles are according to thickness—8 to 11 millimetres, 20°; 12 to 15 millimetres, 15°; 16 to 20 millimetres, 10°; 21 to 25 millimetres, 5°.

2. *Tensile Test.*—When the plates are approximately square, the breaking strain is—

Longitudinal, 35 kilograms, with 10 per cent. extension.

Transverse, 30 kilograms, with 4 per cent. extension.

As these plates are mainly used as connecting pieces, the tensile strength may be taken 1 kilogram lower than in Group I., as the constructor has to work mainly by the lower strength in the transverse direction. For the same reason the extensibility may be reduced from 12 to 10 per cent. When the length of the plate is much greater than the breadth, the values are:

Longitudinal, 35 kilograms, with 10 per cent. extension.

Transverse, 28 kilograms, with 3 per cent. extension.

These plates are mainly applied in the webs of girders, and of cross and longitudinal bearers, whose length is at least eight times their breadth. for which purposes the transverse tensile strength of 28 kilograms is amply sufficient. The hot bending and forge tests are the same as for Group I.

III. Girder iron and flooring plates.

This includes all sections differing from single angle iron, such as I T [⅂ bars, sash bars, etc.; also buckled, corrugated, checkered and similar plates.

Tensile tests for girders:

Longitudinal, 35 kilograms per square millimetre; extension, 12 per cent.

In this class of iron no great transverse cohesion can be expected as the pressure in rolling in such directions is but small. It is customary to use [iron for connecting pieces, on account of its convenient shape, and in such cases a transverse strength similar to that specified in Group II. should be required. This, however, cannot be obtained under the ordinary conditions of manufacture, and it is therefore preferable in such cases to use a combination of flats and angles rather than a solid section. For covering and flooring plates tensile tests are not necessary, the quality of the material being sufficiently evidenced in the manufacture. On account of their large amount of surface, their substance is more likely to suffer from rust than from loading.

IV. Rivet and bolt iron exposed to shearing strains.

To bend cold under the hammer to a loop equal to the diameter of the bar without cracking on the bend:

Tensile strength, 38 kilograms per square millimetre; extension, 18 per cent. The limits specified by the different railway authorities vary between 35 and 40 kilograms.

Hot Test.—A piece two diameters long, when heated to the proper working temperature (that of hot riveting), to bear a reduction under the hammer to one third of its length, without cracking at the edges. The commission does not consider it feasible to introduce tests for building girders. for the reasons that have been previously given under the head of common merchant iron.

Damages to Adjacent Land Caused by a Railroad—A German Decision.

The question of damage to real estate by the construction and operation of a railroad in front of it, aside from the actual taking of the land for the use of the railroad, has assumed new importance in this country by the claims against the New York elevated railroads, which, in some cases, have greatly reduced the selling and rental values of lots and buildings which front on streets in which the roads are built. Heretofore in this country the courts have not awarded damages for such injuries, though they may be as real as if the road cut the land or house in two. The decision in the case of Dr. Caro against the Metropolitan Elevated Company is regarded as an innovation in American law, though the principles there affirmed have been accepted in all other civilized countries, and must be if monstrous injustice is not often permitted. A case recently reported in Prussia will illustrate. We translate as follows:

A lady owned a little property, remote from the noise of the highway, which she occupied as a quiet summer residence. The plot was crossed by a new line of the Cologne & Minden Railroad, and a part of the land was condemned and paid for as the law prescribes; but the railroad company refused to pay damages for the reduction in value of the remainder of the property in consequence of the taking of the other part and of the railroad constructed and operated on it, through the destruction of its retired situation and quiet. The owner then sued the railroad for damages, and the court awarded her what experts estimated as the loss in value by the construction of the road near the house, the injury to it as a country seat, the spoiling of its retired situation by the felling of the greater part of an avenue of chestnut trees which had belonged to the complainant, but were on the part of the plot taken by the railroad company, which left the buildings in full view from the railroad embankment and also from the highway, which had been forced nearer to the house.

The railroad company hereupon appealed to the Imperial Court, which last November sustained the decision, giving the following as the grounds of its confirmation:

The defendant railroad company is of the opinion that it is not liable for damages to the land not taken by reason of its use of the land it did take for the purpose for which it was taken, namely, for a railroad, and that the court below erred by including in assessing the damages circumstances which the Prussian law of expropriation does not admit; but the Imperial Court can not agree with this. The defendant holds that the clause in the law which speaks of the reduction in the value of the land not taken by the taking of the part expropriated means that no regard is to be had, in estimating this damage, to injurious consequences which may be caused by the use to which the land is put after it is taken. But this would contradict the general principle of the law as expressed in its first section, which is that the property in the land shall be taken or limited only with full compensation. In a decision of the Imperial Court in May, 1880, it had already been shown that all regard for damage caused by structures on the land to the remaining part was not necessarily excluded by the terms of the law, but that only such injurious consequences of those structures which had no causal connection with the expropriation, but were of that kind that would have occurred if other land in the neighborhood had been taken. Further, by a decision in May, 1881, it was affirmed that compensation might be awarded for injurious consequences of an enterprise for which land had been taken if the previous owner would not have suffered them if none of his land had been taken.

In the case before the Court, there could be no doubt that the damage to the complainant's remaining property assessed by the experts was related to the expropriation as effect to cause, and that it would not have occurred if no land had been taken. For the railroad crosses complainant's property, complainant was the owner of the land on which the railroad crosses the property, and so had a right to forbid any structure on this land injurious to her property, and only by the expropriation was this right taken from her and the power acquired of causing these injuries to her property by the construction of the railroad which the experts have declared to lessen its value—namely, the destruction of quiet and the attraction of the place as a country residence by the nearness of the railroad to the house and the spoiling of the retirement of the situation by the felling of the greater part of the avenue of chestnuts which had belonged to the complainant, the removal of the wall and ditch and the hedge of fir trees, and the opening of the place to full view from the railroad and the highway. None of these damages could have affected the complainant's land, which served chiefly as a summer residence, but for the taking of the land. and they are therefore without doubt direct consequences of such expropriation, for which, according to § 8 of the law, compensation must be made.

The circumstance that the defendant was already owner of the land when the damaging changes were made on the part of the land it condemned does not exclude the assumption of a relation of cause and effect between the expropriation and the reduction in the value of the rest of the property caused by the new structures, because just these structures first became possible by means of the expropriation. However, it cannot be admitted that the reduction in value was first caused by the actual execution of the works; it rather resulted as soon as the power to hinder their execution was first taken from the owner by means of the expropriation. The value of the main property is determined by the estimate of it made by general opinion under the actual circumstances, and this estimate evidently takes into consideration these changes about to be made, which must lessen the value of the property. From this it results that the injurious consequences of the projected railroad, as a rule, cannot be separated from those of the expropriation, but the prospective reduction in value is chiefly a consequence of the expropriation. For by the terms of the law, plans of the the road as it is to be finally completed must be laid before the authorities who have charge of the condemnation proceedings, which, as appears from specified sections of the law, must include *all* the structures projected. From this alone it appears that it was the intention of the legislators that they should take into consideration the injury caused by the structures also in estimating the damages. But all doubt on the question is removed by § 31 of the law, in which the damages caused by the execution of the works are expressly designated as consequences of the expropriation.

THE SCRAP HEAP.

Encouraging a Railroad.

A few months ago a farmer, living on the line of the Fort Wayne & Jackson road, visited the headquarters of the company to urge the necessity of a new passenger station at a certain cross-road on the line.

"I'm afraid the patronage would not pay the expenses," replied the official.

"I tell you a heap of people would get on and off at them corners," urged the farmer.

"Well, how many of your neighbors have passed over our road this year?"

"How many? Well, there's the old man Skinner for one. He has been to Jackson twice that I know of. Then there's aunt Deborah Smith, who goes down to Fort Wayne every spring and fall. Then we've got several young men who allers go up to Lansing when there's a circus."

"Any more?" asked the official, as the farmer scratched his head and wriggled around.

"N-o, I don't know as I kin think of any more just now, but if you'll go ahead and put a station there you kin count on a dozen of us sitting around there all the time to make things look like business."—*Detroit Free Press.*

The Basic Process for Dephosphorizing.

We may now expect a final decision as to who owns the basic process in this country. The Harrison Wire Co., of St. Louis have purchased from Mr. Jacob Reese, of Pittsburgh, what is understood to be a license to manufacture dephosphorized steel in their new works in Illinois. This question must come up sooner or later, and it might as well come now. What Mr. Reese has to sell will probably be determined by judicial inquiry. If he can grant valid licenses to work the basic process in this country, the gentlemen who have paid considerable money to secure a monopoly of that process will find themselves pretty badly left. If he cannot, the Harrison Wire Co. will find their position more interesting than satisfactory. It is a natural presumption that the parties in interest know exactly what they are doing, and that when the litigation is over others will know a great deal more about the status of the basic process than we do now.—*Iron Age.*

Severe.

The small-minded swindler arrested for stealing railroad passes deserves the severest condemnation. If he had simply stolen the railroad itself he might have become an honored and respected member of the Wall Street Board of Brokers.—*Philadelphia Record.*

"Papa, are you the President of this railroad?" "Yes, my son." "How far have we traveled on this train?" "Oh, about 500 miles, I guess; but why do you ask?" "Because I think it time we came to a watering trough." "A watering trough! Why do you want to come to a watering trough?" "Because, when we go riding with the horses and carriage we stop at watering troughs and water the horses." "Of course, but the cars don't need any water." "Well, then, what did you mean this morning when you told Uncle Judson you were going to water the stock of this railroad?" "Don't be so inquisitive, my son," replied the railroad king, as he resumed reading the *Derrick*, and the train sped on its way.—*Oil City Derrick.*

An Impostor.

Some one—real name unknown—has been traveling through the West representing himself to be Mr. W. W. Finley, Assistant General Freight Agent of the Chicago, St. Louis & New Orleans road. Mr. Finley naturally objects to such misrepresentation, and has issued the following notice:

"I have been reliably informed that a party has been impersonating me in my position as Assistant General Freight Agent of the Chicago, St. Louis & New Orleans Railroad Company. I hereby notify railroad officials that the party is an impostor, and submit a description of him: About 5 ft. 9 or 10 in. in height, straight, good breadth of shoulders, rather spare in flesh, brown hair, moustache and goatee of about same color, though tinged with red."

A New System of Railway Signals.

A number of gentlemen connected with railroad interests left Boston on a special train on Saturday forenoon to inspect the new system of signals in use on the New York & New England Railroad. The advantages claimed for the system of the National Railway Signal Co. are that no batteries are used, but the signals are operated by a mechanical generation of an electric current; that the signals cannot be operated by maliciously disposed individuals, the mechanical work being too great to be done by a force less than that of a locomotive or car; that the signals are automatic in action, requiring no winding up; that visible signals are thrown into position indicating danger by mechanical means, and that crossing signals are continuously operated during the passage of a train from the point where the generator is located to the signal itself, and are stopped by the action of the train. The signals have been in use on the New York & New England road for nearly a year, as follows: At Dudley street, generator for operating crossing signal on out track, for protection of travel at Bird street; at Bird street, crossing signals on in and out tracks, for protection of travel by teams or pedestrians; at Dorchester, generator for releasing block or section signal at Mattapan, and generator for operating crossing signal on out track at Mattapan; and at Mattapan, crossing signals on in and out tracks, for protection of travel on Blue Hill avenue, and block or section signal, for protection of in track. The various devices were examined quite closely by all the gentlemen, their working being practically shown and explained in detail.—*Boston Advertiser, May* 15.

Electricity as a Street Car Motor.

An English paper says that recently a trial trip wa made with Dr. Werner Siemens' improved electrical apparatus and new carriages, on the tramway from Charlottenburg to the Spandauer Berg, in the western outskirts of Berlin. The electrician has in this line solved the problem of making the electric car overcome a rising gradient of one in thirty. For half a mile the line has on leaving the suburb of Charlottenburg, to ascend a hill, and here the speed was maintained at 10 to 12 kilometres, or about seven miles an hour. Once on the top of the Spandauer Berg the line is on a level, and here the cars attained a speed of between 16 and 20 kilometres, or an average of 11 miles an hour. The line, conducted as an ordinary tramway, is distinguished from any other by two thin wire cables, which you perceive at a certain elevation above it, resting on telegraph poles. On these two isolated cables, which are about 9 in. apart, a tiny carriage runs, carried by eight wheels, those on the right being isolated from those on the left. A thin cable unites this miniature machine with the passenger car below, and the two wires it contains transmit electricity from the two cables above to the dynamo, which is fixed to the bottom of the car. On the top of the hill is the steam-engine, which generates the electromotive force. In the first electric railway, produced by Dr. Werner Siemens at the Berlin Industrial Exhibition in the summer of the year 1879, the current was conveyed into the car by means of the rails and wheels, going from one rail into one set of wheels and out again on the opposite side from the wheels into the other rail. Berlin electricians assert that the problem of adapting electricity to tramways is now solved. The two cars employed were not joined to each other, but each went separately. In future, it is intended that two cars shall always leave the terminal stations at the same time, so as to meet half-way, where there is a siding. The stationary steam-engine has to work at the rate of 36 horse-power, in order to produce the necessary force of about 6 horse-power for each of the two cars when on the level part, and of 10 horse-power when ascending the hill. Dr. Siemens also shows an electric conveyance, which runs on the high road without rails.

A Moving Town.

A moving town, which can certainly be classed among the modern curiosities, actually exists in Manitoba. It is called "Boomtown," and can always be found at the terminus of the Canadian Pacific Railroad. When the town is located, building lots are sold at fancy prices, and in a day or two the place contains all the evidences of a bustling, busy place, but with another advance of the construction party the old site is vacated as if by magic, and the lively scenes are transferred to another locality, which is given the same name, contains the same people, and the houses and tents are constructed of the same material that composed the former residences.

A Complicated Accident.

A dispatch from Hartford, Conn., May 11, says: "A locomotive running wild played sad havoc this evening in the New York & New England Railroad yard. It was a large switching engine with tender and a heavy flat car attached. A slight collision being apprehended near the East Hartford bridge, the engineer and fireman deserted the engine. By the collision another engine and two freight cars standing near the bridge were derailed. The shock threw open the throttle valve of the wild engine, and it came rushing into the city on the main track at a speed of 50 miles an hour. Near the depot it collided with another engine which was just passing from the main track to a siding. The runaway engine was thrown on its side and wrecked. The engineer of the other engine had deserted it when he saw his danger. Although badly smashed and its tender wrecked, this engine kept on and smashed into still another one near the engine house. Strange to say, no one was injured. The damages will not exceed $3,000."

In the Sleeper.

As the train was about to leave the Union depot for the East the other night, a man with a satchel said he'd heard a heap about "them sleeping cars," and he guessed he'd try one once. Making the necessary arrangements, he was admitted to the car, and soon settled himself into a seat. Before reaching Trenton he was asleep, feet on the opposite cushion, and his satchel for a pillow. The porter finally got ready to make his bed and gave him a shake to arouse him.

"Who in blazes be you?" growled the man as he opened his eyes.

"De porter, sah."

"You are, eh! Well, now you look here! I never saw you before, and never shall again, but I want you to understand that I'm no chicken. I paid $2 for the privilege of sleeping in this car, and just as I get into my first snooze along you come and wake me up. If you want a chaw of tobacco or a match you can have it, but don't break in on my dreams again if you want to be alive when we get to Buffalo. When I buy certain rights I'm going to have 'em or bust."—*Detroit Free Press.*

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EDITORIAL ANNOUNCEMENTS.

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Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

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OPERATING EXPENSES—WHEELS, RAILS AND TIES.

Last week some space in these columns was devoted to an analysis of the operating expenses of railroads—the figures in the last report of the Lake Shore road serving as a sort of text for the discussion. The expenses of that road were divided up into four classes, the second including "Maintenance of Road," which for convenience of reference is reprinted from the article of last week.

2. Maintenance of Road.

	P. c. of total expenses.
Repairs of bridges, etc	1.24
" " buildings and fixtures	2.78
" " fences, etc	0.56
Rail renewals	3.17
Tie renewals	2.56
Repairs roadway and track	8.54
	19.35

In the article referred to we tried to show that the direction in which we must look for a reduction of the expenses included under the first class, which is greater than any of the others, is the improvement of cars and locomotives, so that still greater trainloads will be possible, and to the use of improved appliances in handling freight, so that a given number of men can do more work than they are now doing. In the present article it is proposed to consider some of the other expenses to see where we may look for a reduction, and what steps should be taken to indicate how they may be diminished.

The cost of "maintenance of road" it will be seen is 19.35 per cent. of the total expenses. Of this 14.77 per cent., or all but 4.58 per cent., is included in rail renewals, tie renewals and repairs of roadway and track. Any considerable reduction in the cost of maintenance of road must therefore be made in some or all of the three items named.

The first, rail renewals, 3.67 per cent., will strike many of our readers as being very low. The average percentage per year of the cost of rail renewals on the Lake Shore road for the twelve years from 1870 to 1881 inclusive was 6.79. To what extent this average cost will be diminished by the use of steel rails can only be determined after they have been in use for a longer time, and when their average life will be more definitely known. During the first six years from 1870 to 1875 the percentage of cost of rail renewals was 8.87, whereas during the six years from 1876 to 1881 it was only 4.41, or somewhat less than half what it was during the first decade.

Such investigations as those which have been conducted by Dr. Dudley on the Pennsylvania Railroad will, undoubtedly, indicate to railroad engineers what qualities the materials of which rails are made must have to increase their resistance to wear. If the knowledge attained in this way is used by railroad managers to guide them in specifying the qualities of the rails furnished them, it may reasonably be expected that the cost of rail renewals will be diminished still more.

There is good reason for thinking, though, that it may be lessened by improving the form of rail sections and the tread and flanges of the wheels. To a very considerable extent these have been designed by different persons and quite independently of each other, and with very little reference to the wear of the one by the other. A great deal of thought has been given to the design of rail sections, and if there is any one thing which the average railroad engineer thinks he is competent to do, it is to proportion the different parts of a rail so as to attain absolute perfection within a very minute fraction of an inch. Wheel-makers and car-builders have apparently less confidence in their ability to design wheels which, as the lamented Holley expressed it, "hit perfection within a sixty-fourth of an inch." At any rate, the wheels and the rails have grown up quite apart from each other, the rail man assuming, what was usually true, that he could not change the wheels, and the wheel man that the rails were quite outside of his range of influence. The consequence is that they are not suited to each other, and the conditions under which they wear are far from being the most favorable for their endurance, as a little consideration of the problem will show.

It may be said, parenthetically, that there are certain mechanical as well as moral truths that the human mind seems to have an aversion to accepting. Among the former is the one that the wear of the parts of a mechanism is in inverse proportion to the area of the bearing surfaces in contact. Notwithstanding the fact that this is demonstrable, both theoretically and experimentally, and has been proved a thousand times, and only requires a little intelligent observation to make itself ocularly evident, a large proportion of mechanical Philistines will resist this truth to the utmost capacity of their stupidity. It took years of persistent agitation to secure the recommendation of the standard car axle, the great merit of which is that it gives more bearing surface for the wear of the journals. In locomotive construction every increase of an eighth of an inch in the diameter or length of the crank pins, or every sixteenth added to the bearings of the valve gear, is effected in the face of opposition which is quite certain to array itself against such changes. It seems to be the spirit of resistance to this truth which prevents engineers and mechanics from appreciating the value of amplitude of bearing surface between the wheels and the rails.

To whatever cause it is due, it is certain that the form of the one in relation to the other and the conditions under which they work are very unfavorable for resisting wear. The almost universal practice is to make the wheels coning while the tops of the rails, in relation to the cross section of the track, are laid horizontally or approximately so. When the wheels are new they therefore bear on a small surface of contact on the inside of the rails. The latter are thus worn away by the new wheels at this place, so that the old wheels will then bear only on the outer edge. In this way the intensity of the pressure of each is many fold greater than it would be if it was evenly distributed over the whole top of the rails. Even if the latter were inclined, so as to correspond with the cone of the wheels, we would then have the inner or larger portion of the cone moving at a greater speed than the outside, and thus one or the other must slide, so that a grinding action of the wheel on the rails occurs, which is more or less destructive to both. Probably the general prevalence of the superstition about the value of the conical form for the treads of wheels has cost railroad companies many hundreds of thousands of dollars.

It is usually the case, too, that the rails are laid on rough-hewn ties, so that their horizontality—to coin a word—is by no means assured, as may be seen if we notice the wear of new rails laid a short time; some will be worn on the inner edge and others on the outer edge of the top of the head, showing that while the former are level, or perhaps that their vertical centre lines incline outward, the others incline inward.

The shape of wheel flanges, too, is still determined by the crudest empiricism, and each wheel-maker follows his own inclinations and prejudices in the form which he uses. In the design of the most recent forms of rail sections which have been adopted as standards, the shape of the side of the head, which resists flange wear, has been made of the form to which it wears in use, and it has been somewhat hastily concluded that this form is the best, whereas all that has been indicated by practice is that the form adopted results from the wear of the multiplicity of different flange shapes in use. They, in turn, are worn in a special way by the form of the rails on which they run. Now it may be that if each of them were changed in shape, the ultimate form, produced by wear, would be quite unlike that which results now. There is good reason, too, for believing that the shape into which a rail wears is not the best one to resist the abrasion of the wheel flanges. No one would shape the flange or tread of a wheel from that of a worn tire. In point of fact, it is generally considered that when a flange assumes the shape which wear gives it, it is unsafe to use. There is reason for believing that the flange wear of the rails makes the latter dangerous for very much the same reason that the rail wear of the flanges makes the wheels unsafe. Be this as it may, it is certain that the present shape of rails and flanges is not the best possible for resisting the wear of the one by the other. Even if there were no other reason, the diversity alone of the forms in use must be sure to result in greater wear than would occur if there were more uniformity. Each change in shape of either rails or flanges results in bringing new bearing surfaces in contact; owing to the way in which they are now made, one or both of these surfaces are convex, so that their theoretical contact is a point only. The pressure therefore is so great that the metal is rapidly abraded, and as this wear is constantly changing from one place to another as the shapes of the wheels and the rails do, is it not surprising that the one should be rapidly ground away by the other. The imperfect construction of car trucks and the inaccurate gauging of the wheels all have their influence in producing undue wear, but these will be considered under the head of car repairs.

No evidence seems to be required to show that if the wheels were perfectly cylindrical on the treads, and the rails were laid with their top surfaces forming a portion of a perfect plane, so that the former would have a bearing over the whole width of the latter, the wear would be much less than it now is, when, as has been shown, one wheel bears on an extremely small surface on the inside of the rail, and the next one will be in contact with an equally small area on the outside. There is good reason for believing then that the resistance of rails to wear may be much increased, and consequently the cost of rail renewals be diminished by improving, first, the quality of the material of which they are made; second, their form and that of the wheels, and, third, the way in which the rails are laid. For the first we must call in the aid of the chemist, the investigation of the second will require the most thorough knowledge of graphical methods of studying such subjects, and the third would be included under the duties of a roadmaster. But even if it were distinctly shown how the wear of rails could be diminished, before the full benefits of such knowledge could be realized there must be some co-operation among railroad companies by which some degree of uniformity in their practice may be brought about. If one line should adopt designs of wheels and rails suited to each other, it would still suffer if the cars of other lines, with all kinds of wheels, must pass over its rails. Possibly the time may not be as remote as some persons think when universal standard freight cars may come into use, and the main lines will refuse to receive for interchange those cars which do not conform to the standard. Be that as it may, there is without doubt much room for improvement in wheels and rails, and it seems very probable that the cost of these may still be very materially diminished by such improvements.

With reference to the renewals of ties, it may be said, as of nearly all other subjects which are taken up for thorough study, that the knowledge we have of it is still in a very unsatisfactory condition. From the nature of it the preliminary knowledge which we must have to guide us in our investigations must be of a statistical character. Of the latter there is very little in existence which is at all satisfactory. To be of much value the data must extend over a considerable number of years so as to fairly represent the average life of ties. A simple record of all the ties laid on a road and of those taken up, and giving the locality in or from which they were placed or taken, the traffic, kind of timber and ballast would be of very great value in studying this subject. At present there is no very definite knowledge accessible which will indicate the endurance of different kinds of timber, the effect of soil, climate, drainage, ballast and traffic on them, or of the value of treating them in various ways. A committee of the Society of Civil Engineers appointed to report on this subject, under the chairmanship of Mr. Chanute, is very actively at work, and will no doubt make a very valuable report. It is in the investigation of subjects of this kind, though, that the value of clerical work makes itself apparent. Last week reference was made to the fact that at best only a small amount of saving could be effected in clerk hire. We here have

a yearly expense on the Lake Shore road of about $300,000, which it is impossible to investigate understandingly without a record of at least ten years' service of the ties in use. A record of such service would probably indicate some very important facts in a very unmistakable way. It seems probable, too, that in this country we will soon be compelled to resort to some process of treating timber to increase its durability. The value of such processes can never be definitely known, unless very full and complete data are accumulated of the endurance of ties thus treated.

The cost of tie renewals can be satisfactorily investigated only with the light which correct statistics will shed upon it, and any possibility of reduction in this item of expense will probably be indicated by this means.

We must again defer the completion of the discussion of this subject for another number.

EXTENDING RAILROADS THROUGH NEW COUNTRY.

There is a great temptation to push out numerous lines over a fertile territory in advance of population. If the land is good, like Iowa, Minnesota and part of Dakota, it is sure at some time to be all occupied by farmers and to yield a large profit on the capital invested in a railroad system which serves it. It may not yield $200 a mile in net earnings the first year, but when the land is mostly occupied trunk lines across it are very likely to make a profit of $5,000 and may make $10,000 a mile, and long before they will contribute a profitable traffic to the older lines east of them in the more thickly peopled country. Having a line 200 or 300 miles long from Lake Michigan to the Mississippi, there is the double inducement of the prospective advantage to the old and direct profit from the new to lead the owners to extend a line, or a system of lines, into and finally across Minnesota; but having reached the Dakota border, the lines we may build in that territory will contribute their traffic to a line 500 or 600 miles long to the east, and, when Dakota is occupied, will also be profitable by themselves. A Western company is, therefore, constantly stimulated to extend its lines further and further into the wilderness, as far as fertile lands extend. Thus, we see the Chicago, Burlington & Quincy, which, reaching the Mississippi, made an extension to the Missouri; then made a system in Nebraska entirely across the agricultural belt to the grazing plains, and now crosses those plains even to the foot of the mountains at Denver. The last extension will contribute traffic to a completed line of the company about 800 miles long, and may be a profitable investment, even if the carrying of traffic *over it* does not yield a dollar, provided it adds to the profits of the 800 miles of line previously built. And it is this of late years which has caused by far the larger part of the new roads to be built, directly or indirectly, by old companies, as their extensions or branches; the new lines are worth more to them than they possibly can be to any one else.

To this construction of railroads over unoccupied but fertile country there is but one general limit, and that is the danger of making the lines too long before population will follow. We have seen plenty of instances of this in new states and territories. There are many lines, now making magnificent returns, which had so little traffic for some years after their completion that they failed to pay any interest on their cost. When an old company builds the road, the importance of an immediate direct return is less, for the new road, which lacks $100,000 of earning the interest on its cost, may contribute to an old road traffic on which a profit of $200,000 is made.

But it is nevertheless possible to build roads before their time. Rapid as is the growth of population even in such a year as this, when with a probable natural increase of more than 1,000,000 the country will receive perhaps 1,000,000 immigrants, there is a limit to the new country that can be occupied and brought under cultivation in a single year or term of years. After all, the chief growth of the country is not on the border, but further east, though the *rate* of growth is much the fastest in the new country. The population of Nebraska increased 268 per cent. from 1870 to 1880; that of New York only 16 per cent. But the addition to the population was 701,051 in New York, and but 329,440 in Nebraska. In that decade the three new states, where land was to be had for nothing or at very low prices, were Minnesota, Nebraska and Kansas; they gained 1,300,107 in population in the ten years, the rest of the country 10,294,000, and the three comparatively old and contiguous states, Indiana, Illinois and Iowa gained 1,267,000, or nearly the same as the three border states. If we have an unoccupied territory capable of supporting as much population as Iowa, and at once build in it one fourth as much railroad as Iowa now supports, some of these railroads may not earn interest on their cost in ten years, though they may earn 20 per cent. in 20 years; and yet the territory may grow rapidly.

But if there are dangers as well as great advantages in extending railroads into new country, it often is hardly possible to be inactive. If there were but one company on the border it might choose its time, push out extensions and branches slowly and cautiously, only advancing when the ground behind was pretty well occupied. But with several powerful companies abutting on the same frontier, this cautious and conservative course is hardly ever possible. Unless our company advances, our rival will occupy the ground in front of us, and we shall find our road fenced in as it were, and the choice routes for lines in the new country occupied by roads which will contribute no traffic to our main lines. The most active and confident sets at work all the other companies, which push forward lest they may be outflanked, though they may believe the time too soon for so great an extension.

But should all the companies on the border act in concert, or should there be but one, the choice of the time for important new extensions requires singular judgment and foresight. It was as certain in 1875 as it is now that Western Minnesota and Eastern Dakota would some time have a large population and supply a large traffic to the railroads crossing Minnesota. But it was then manifestly not the time to cover the new country with railroads. *It was not growing*, and there was then no tendency of immigration thither, and the settlers who were there were not prospering. When about 1878 there began to be a movement to this new country, it was still uncertain whether it would continue; and the next year, when the movement was very active and the government land was rapidly taken up, it still remained a question how long the movement would last and how far west it would extend. It might pay to extend lines to the Dakota border, but was it not dangerous to push them further? To judge, it was necessary to forecast the future. How fast is the country growing, and where and how is the increase in population occupied? Will foreign immigration, which has begun to grow rapidly, continue to grow? How great a field of cheap farming lands remains to be occupied, and what parts of it will be likely to be occupied first? Where have new settlers prospered most of late?

Such questions as these we must find answers for if we would judge correctly of the immediate future of a new country. About 1868 and for some years thereafter the great rush of settlers was to Kansas; a little later to Kansas and Nebraska. Minnesota did not grow rapidly then, and nearly all the railroads built there then were unprofitable for years. Railroads in Dakota then would have brought scarcely any population, in Manitoba probably none.

It is necessary also to take care not to build too much new railroad at once as well as not to build it too soon, and the question of too much or too little also depends upon the circumstances and the probable future course of events. It is very easy to open to settlement by means of railroads more country than can be occupied for several years; and in this much depends on the concurrent action of the different companies reaching the same territory. For instance, Dakota being the chief field for settlement, and the influx promising to justify the construction of 1,000 miles at this time, the Northwestern may begin 300 miles, estimating that the other roads will not build more than 700; if then the Milwaukee & St. Paul builds 600, the St. Paul & Omaha 200, the Manitoba 400, and the Northern Pacific 300, we have 1,800 miles of road where but 1,000 are required, and consequent delay in the time when they will become profitable—delay which may affect all of them; for the population which otherwise would have been concentrated along 1,000 miles of road is now scattered over 1,800. If the new lines were constructed a little at a time, then the extensions of each year would be adjusted to the prospects of the next succeeding year; but the competition of the companies induces them to build much at a time, when there is a prospect of rapid settlement, lest they be anticipated by rivals. Not a mile of railroad was built in Dakota after 1873 until 1878, and in 1878 but 24 miles; then in 1879 241 miles, in 1880 724 miles, and in 1881 390 miles—1,355 miles within three years. The eastern border of Dakota, it must be remembered, is about 450 miles long, and settlements are being made from the extreme north to the extreme south, which is more extensive than twice the border of either Nebraska or Kansas. Nevertheless, this large mileage of new road constructed within three years, together with another large mileage built in contiguous thinly populated country in Western Minnesota, Northwestern Iowa and Northeastern Nebraska, has opened to settlement a vast area of agricultural land, which, judging from the experience of Iowa and Minnesota, will not be generally utilized for many years.

There is, however, one reason to suppose that this new territory will grow faster than the states adjoining it on the east. It now includes most of the very cheap lands fit for cereals in the United States this side of the Rocky Mountains. Fifteen years ago the Eastern farmer migrating could choose a homestead along a frontier of nearly 900 miles, as far south as the Indian Territory, and through many degrees of longitude—in Western Iowa, almost anywhere in Kansas and Nebraska, in Southwestern Missouri, as well as in Minnesota. Now the desirable agricultural land in Kansas, and in Nebraska south of the Platte, is mostly taken (not by any means all cultivated) to the borders of the grazing belt; no homesteads are left in Iowa comparatively few in the prairie lands of Minnesota. The field for settlers is so confined that there is a great overflow into Manitoba. To get fertile land with a reasonable certainty of sufficient rainfall to make grain growing successful for less than five dollars an acre, the immigrant must go to Western Minnesota, Dakota, or Northeastern Nebraska, or cross the continent to Oregon and Washington.

Should this country grow for four or five years as Kansas and Southern Nebraska grew for a few years after 1867, the investment in the new roads there will doubtless be extremely profitable, and the companies which have built the most road will reap the greatest advantage. Should settlement be interrupted, however, as may be the case should there be successive crop failures or other untoward events, or a diversion of industry to other pursuits, other countries (as to Manitoba), or other parts of the country, then they may be unprofitable, and the company that has most of them may suffer greatly by its ventures, with little comfort at the time in the certainty that ten or fifteen years later the lines then swelling its interest charges without adding to its profits will be a source of great gain.

Foreign Railroad Notes.

During the first month that the new Berlin City Railroad (elevated) was open, Feb. 15 to March 15, it carried 769,781 passengers—26,544 per day. The receipts were about $36,648, or $1,264 per day, which is at the average rate of but 4.8 cents per passenger. The fares vary according to distance and class of car. The lowest rate in third-class cars (no first-class cars are run) between two stations is 2.43 cents, and the stations are from less than half a mile to 1¼ miles apart, the lowest through fare for the 7 miles total length of the road being 9.7 cents. There are, however, commutation tickets, round trip tickets, etc., at somewhat reduced rates, and also laborers' tickets. The greatest number of persons carried in one day was 60,925—about an average day's work on the Sixth avenue elevated road in New York—the smallest was 17,857. The western terminal station (the suburb of Charlottenburg) averaged but 309 passengers and $21 of receipts per day. At the city stations there were from 2,000 to 6,000 passengers daily.

This is a four-track road, two tracks serving for through trains only and for the railroads entering Berlin from the west and the east, and their traffic alone should be considerable, though possibly it is not included in the report for the month. Trains to the west now start from a station east of the city and stop at three or four stations in the interior of the city, while trains to the east start from a suburb west of the city and make the same stops in the city, so that the trains can be reached from any part of the city by a comparatively short journey. Berlin is nearly as large as New York, but not by any means as long, and an elevated railroad is there not nearly so useful for city travel. The road was an extremely costly one—$16,000,000 has been expended on it and the ground bought for it, but the government expects to be able to sell enough of the land it had to buy to amount to $2,000,000. Even in that case the cost will be $14,000,000 or $2,000,000 per mile, and the gross receipts of $36,648 in the first month will have to be multiplied several times in order to pay interest on that amount. The chief gainers, very likely (as in so many other cases), will be the owners of land in the suburbs, which the railroad will convert into city property.

The Germans are accustomed to express a very low opinion of Russian railroad management, and almost everything Russian, including public and private morals. One of the latest stories told (which the reader may swallow if he pleases; it is told as seriously as an official report) is the following: The managament of the Southwestern Railroad appointed a committee to devise means to prevent the very frequent stealing of freight from the station platforms. This committee came to the conclusion that the chief cause of these thefts was the lack of honesty among the station watchmen, partly explainable by their very low wages. The best means to prevent such thefts, the committee thought, would be, not the employment of honest watchmen, at wages sufficient to secure that kind of man, but the raising of a sufficient number of savage dogs to bark at and bite the thieves! With their report the committee submitted a set of rules for training the dogs, showing how they should be fed, when chained, when let loose, and so on. They also drew up estimates of the cost and keeping of the

dogs, according to which the Odessa freight station would include in its yearly expenses a charge of $2,000 for "maintenance of watch dogs"! All of which would lead one to suspect that the members of the committee had a "corner" on watch-dogs, and wanted to "unload." But a German paper gravely says: "Would it not be more rational to prevent these lamentable occurrences by raising the standard of morals among the laboring class?" And we venture to add: Who will keep the dog-keepers? Suppose they should train their dogs *not* to bark and bite when the keepers' confederates should carry away the goods?

The government regulations for the operation of the railroads of the German Empire defines "passenger's baggage" as including only such articles as the traveler carries with him for the use of himself and his family on the journey, to wit, trunk, cloak and traveling bags, hat-box, small boxes, and the like. Other articles not required for use on the journey may be carried as baggage, in exceptional cases, but they may not be included in the 55 lbs. carried free. But the Prussian state railroads have announced that after the last of May of this year, the following articles may be included with what is carried free: Rolling or other invalid chairs which persons who are visibly sick or crippled carry with them, and likewise baby-wagons; samples carried by commercial travelers in the exercise of their vocation and which are recognizable as samples by the way they are put up; musical instruments in boxes, cases or other inclosure; measuring rods, staves, and other instruments which surveyors carry with them.

The Prussian House of Lords has voted almost unanimously in favor of a proposition giving each member of the House a free pass over the government railroads between Berlin and his residence. This is modest: the American legislator would want a free pass over the whole system. The report says that "The Administration promised to take this, in its opinion, well founded proposition into favorable consideration."

The Prussian Minister of Public Works has recently ordered that free passage in third-class cars shall be given to the children of the state railroad employés traveling to and from high schools of all kinds (except colleges and universities), or places where they take special instruction in music, trades, etc., a privilege which may be of great value to the employés and of very little cost to the railroad.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Austin & Northwestern.—Extended northwest 20 miles, to a point sixty miles from Austin, Texas.

Buffalo, Pittsburgh & Western.—Extended from Kinzua Bridge, Pa., northeast to Salamanca, N. Y., 32 miles.

California Southern.—Completed to a point one hundred and eight miles northward from San Diego Bay, Cal., an extension of 21 miles.

Chicago, Burlington & Quincy.—Track on the *Denver Extension* has been extended from Akron, Col., westward 40 miles.

Chippewa Valley & Superior.—Extended southwest to Durand, 5 miles.

Cincinnati, Columbus & Hocking Valley.—Extended from Allentown, O., northeast to Jeffersonville, 5 miles, and from New Burlington west to Claysville Junction, 3 miles.

Cincinnati, Wabash & Michigan.—Extended from Goshen, Ind., northwest to Niles, Mich., 28 miles.

Georgia Pacific.—Extended westward to Douglasville, Ga., 13 miles.

Missouri Pacific.—Track is laid on the *Omaha Extension* from Atchison, Kan., northwest 22 miles.

New York, Texas & Mexican.—Extended from East Bernard, Tex., south by west to Victoria, 85 miles.

Pensacola & Atlantic.—Track laid from Milton, Fla., eastward 15 miles.

St. Louis Coal.—Extended from Harrison, Ill., north to Pinckneyville, 20 miles. A branch has also been completed from Harrison to Murphysboro, 2 miles.

St. Louis, Iron Mountain & Southern.—The *Crowley Ridge Branch* is extended southward to Harrisburg, Ark., 40 miles.

This is a total of 350 miles of new railroad, making 2,854 miles thus far this year, against 1,210 miles reported at the corresponding time in 1881, 1,330 miles in 1880, 562 miles in 1879, 312 miles in 1878, and 365 miles in 1877.

THE RELATIONS OF THE GREAT WESTERN TO THE WABASH were made much of in the campaign which resulted in the overthrow of the late Great Western board. Mr. Abbott, the conductor of this campaign, in his speech to the shareholders, charged that the Great Western was made agent of the Wabash in London for the sake of using its credit in palming off on English investors the bonds and preferred shares of the Wabash Company, which have since gone down greatly in price; and he also said of the contract for an interchange of freight between the Wabash and the Great Western, that it was made only to induce Mr. Vanderbilt to give certain desired facilities and rights to the Wabash, and that when these were secured Mr. Gould (meaning the Wabash, of which Gould was not an officer at the time, we believe), said: "The agreement does not work smoothly, and therefore there is no necessity to send the traffic over the Great Western of Canada;" and that the Wabash "then sent its traffic over Mr. Vanderbilt's line."

In reply to this, Colonel Grey, President of the Great Western, said: "As to the agreement with the Wabash being useless, whereas from that district this company never received a pound of goods before, it now has one-third of all that comes." This is true. By agreement a year or so ago the Wabash traffic was divided equally among the Lake Shore, the Canada Southern and the Great Western. Some one saying that the traffic did not pay, Colonel Grey replied that though the traffic only began last October, it had averaged £300 a week for the whole half year (beginning with August), and that but for it there would have been no dividend at all. This would make the earnings from Wabash traffic $28,500 for the four months ending with January last; but unless the Wabash contract secured higher rates for it than the *pro rata* arrangement prevailing among other roads, there was certainly no profit on this traffic. The terms of the Wabash-Great Western contract have never been published, but the first rumor was that the Wabash was to pay but $5 per car from Detroit to Suspension Bridge, and then that $5 was to be the minimum and $10 the maximum, and within these limits the receipt to be prorated. Either of these would be very low rates, but probably the lowest was about as much as a *pro rata* would have been in the last half of last year; and that the contract has not been altogether favorable to the Wabash may be surmised from the fact that the Wabash (according to Sir Henry Tyler) some time ago gave the necessary six months' notice that it would be abrogated.

It is altogether probable, however, that at the time the Great Western President, about a year ago, held out the prospect of a favorable contract with the Wabash as a reason for refusing union with the Grand Trunk, he expected to secure much more than the one-third of the traffic which he finally obtained, and that the hope of such larger share was held out to him, and was held out for the purpose of influencing the action of the Vanderbilt companies. But this is just what is done whenever a contract is made concerning business, for which there are several competitors. If the Wabash could not have got what it wanted of other roads, doubtless it would have given the Great Western all the traffic it could command. The contract as actually made has been strictly executed, we believe, and that it has not been more profitable was certainly not the fault of the Wabash, but of the railroad war and the short crops, from which the Wabash itself was a vastly greater sufferer than Great Western. Whatever the Wabash may have gained by the London agency which placed its shares and bonds, it cannot have gained anything worth mentioning by its traffic contract with the Great Western.

CHICAGO RAIL SHIPMENTS EASTWARD continue to decline slightly. For the week ending May 6 for three successive years they have been:

	1880.	1881.	1882.
Tons	27,000	22,351	28,273

The comparison with last year is deceptive, for last year it was the week of the yard switchmen's strike, when the shipments were not half as great as in any previous week of the year, except one of snow blockades. The decrease from the previous week of this year was only 1,255 tons. Of the total shipments this year in the week ending May 6 the Chicago & Grand Trunk carried 14.2 per cent. of the total shipments, the Michigan Central 17.5, the Lake Shore 13.3, the Fort Wayne 34.1, the Pan-handle 10.5, and the Baltimore & Ohio 10.4. Thus the two Vanderbilt roads had but 30.8 per cent. of the whole, against 49 per cent. in the pool of 1880, and the two Pennsylvania roads 44.6 per cent., against 33 in the pool. The Grand Trunk is still much above its old pool percentage, and its excess seems to come from points west of Chicago, as it has a much smaller proportion of the shipments billed from Chicago.

For the first four months of four successive years the Chicago shipments have been, in tons:

	1879.	1880.	1881.	1882.
January	192,512	163,378	263,872	321,166
February	198,541	166,541	204,331	225,816
March	258,458	318,983	212,021	179,145
April	298,042	186,543	277,417	138,475
Four months	947,553	835,445	955,641	864,602

Thus in spite of the fact that the shipments in January and February were larger this year than in any of the other three, the shipments of the four months were 9½ per cent. less than last year or in 1879, and nearly the same as in 1880, when for the first two months the rate was 40 cents per 100 lbs. on grain from Chicago to New York, in March 35 cents, and in April 30 cents. The shipments in April were this year only about half as great as last year, when the rate was five cents higher, 26 per cent. less than in 1880, when also it was five cents higher, and 54 per cent. less than in 1879, when rates were badly demoralized. Navigation was open throughout April this year and in 1880, but not at all in the other two years. There have been but two months in the forty since 1878 that the Chicago shipments were as small as last April—September, 1879, when they were 134,141 tons, and May, 1880, when they were but 125,157 tons. We are very likely to reach the lowest of these figures within the next three months, but that there is nothing serious in them may be inferred from the fact that the smallest shipments were in the year when the profits on through freight were much larger than they have been in any other year.

For the week ending May 13 the shipments billed from Chicago (not including those from points beyond billed through Chicago) were 17,848 tons, against 21,835 the week before. Flour made up 2,046 tons of the shipments last week, and grain 9,626 tons—an exceptionally small quantity. The Fort Wayne and the Pan-handle carried about two-thirds of the provisions, but only one-third of the grain and flour. The Vanderbilt roads carried 46 per cent. of the flour and 42 per cent. of the grain, but only 25½ per cent. of the provisions. The Grand Trunk carried but 6.4 per cent. of these shipments billed from Chicago, but the week before it carried but 9.6 per cent. of such shipments, while it had 14.2 per cent. of the total, including the shipments billed through Chicago.

THE CHICAGO, ROCK ISLAND & PACIFIC COMPANY has issued a statement of its gross earnings, working expenses and fixed charges for its last fiscal year, ending with March last, in advance of its annual report, giving a clue to the course of transportation business in the Northwest for a later period than we have had hitherto. Compared with the previous year, the figures are:

	1881-82.	1880-81.	Inc. or Dec.		P. c.
Earnings	$13,266,643	$11,956,907	I.	$1,209,736	11.0
Expenses	7,322,862	6,630,155	I.	692,707	10.5
Net earnings	$5,943,780	$5,326,752	I.	$617,028	11.6
Fixed charges	1,250,780	1,271,837	D.	21,057	1.7
Surplus	4,693,000	$4,054,915	I.	638,085	15.7
From land	650,000	490,000	I.	160,000	32.6
Total	$5,343,000	$14,544,915	I.	$798,085	17.4
Per share	$12.73	$10.83	I.	$1.90	17.4

This certainly is a brilliant showing, made in spite of light crops everywhere and very poor ones on part of this company's lines (chiefly in Missouri), and in Kansas, from which it receives a large part of its through traffic, and made with very little addition to mileage. This is one of the few roads recently reporting which shows a larger percentage of increase in earnings than in expenses. The increase in expenses, however, is large. It must be remembered that its business was not spoiled by the railroad war like that of lines east of Chicago and east of the Mississippi south of the Rock Island road. On the contrary, the roads from Chicago to the Missouri River had a long railroad war in 1880 and comparatively little trouble last year. The traffic affected, however, is a much smaller proportion of their whole traffic than the through traffic of the roads further east, and this, indeed, has been one of the great advantages of the Western roads. Their conflicts, however long and reckless, have not been able to spoil as much of their business as those of the trunk lines and their immediate connections.

The Rock Island's profits for the last year were at the rate of $12.73 per share, as against $10.83 the year before. This company has very light fixed charges—interest and rentals amounting only to $900 per mile of road worked, while the net earnings last year were $4,250 per mile. Thus the stock has nearly four-fifths of the profits, and the bonds have a margin which puts them among the securest of railroad securities. If the company had occasion to borrow a few millions now it could probably get money for about 4 per cent.

The large income from the land department will doubtless soon cease, by the disposal of the small remainder of the lands and the payment of the notes given for the sales made heretofore. A year ago 125,000 acres remained unsold, but there was then due on sales and contracts for sales more than $1,500,000. Thus there will continue to be receipts from the land department after the lands are all gone. In a few years, however, these must become insignificant. These receipts were at the rate of $1.55 per share of stock last year, and of $1.17 the year before—a very considerable addition to the profits. This and a very large amount of the income from traffic can be lost without affecting the ability of the company to pay 7 per cent dividends, however. Meanwhile its traffic is sure to grow, and though its profits are not likely to grow in the same proportion, they will grow fast enough to offset many unfavorable occurrences, should such happen.

UNITED STATES GRAIN EXPORTS, as reported by the Bureau of Statistics, during April, the four months ending with April and the ten months then ending, were of the following values:

	1882.	1881.	Decrease.	P. c.
April	$9,835,205	$20,421,008	$10,585,803	51.8
Jan. 1 to April 30	45,402,206	71,570,621	26,168,415	36.6
July 1 to April 30	157,546,121	225,150,795	67,604,674	30.0

In quantities there is a decrease in April of no less than 6,161,132 bushels, or five-sixths, in corn; of 5,849,297 bushels, or 55 per cent., in wheat, and in flour of 168,649 barrels, or 26 per cent. Nearly half (49 per cent.) of the total wheat exports was from San Francisco, and more than half (53½ per cent.) was from the Pacific coast, while the percentages from other ports usually prominent as wheat exporters were: New York, 29.2 per cent.; Baltimore, 11.8; Philadelphia, 2.0; New Orleans, 1.7; Boston, 1.3. The percentages of the total values of flour and grain exported from the Atlantic ports during the four months this year and last have been:

	New York.	Boston.	Phila.	Baltimore.	New Orleans.
1880	66.0	12.1	4.4	15.3	7.5
1881	52.9	8.3	10.0	21.3	2.2

The whole amount exported from these five ports, however, was but $29,248,198 this year, against $59,369,108 last year. The Boston exports in April were chiefly flour, in which, as usual, it stood next to New York, though very little ahead of San Francisco. But New York and Boston exported 87 per cent. of the total flour from the five Atlantic ports, and Baltimore 12 per cent., leaving barely 1 per cent. to Philadelphia and New Orleans together.

THE AVERAGE COST OF BRITISH RAILROADS, according to the latest returns, has risen to $197,651 per mile, while the average of American railroads was but $60,651. The net earnings of the British roads were $8,654 per mile; of the American roads, only $3,030 per mile. The net earnings were 4.38 per cent. on the capital in Great Britain and 5 per cent. here—not as much as the average difference in rates of interest in the two countries. The traffic of the British railroads is on the average much greater than that

of ours, but average rates are much higher there for freight, and the difference is not in proportion to the difference in earnings. There are many roads here with a much larger traffic than the British average—some with a freight traffic probably above the British maximum, and a passenger traffic not much less—but there are only three or four roads whose capital is equal to the British average, and only one of these, we believe, pays any interest on all its capital. The capital of the New York Central & Hudson River is $184,610 per mile of road owned; of the New York, Lake Erie & Western, $289,668; of the New York, Pennsylvania & Ohio, $314,000. The latter, however, pays interest on less than one-third of its capital; the Erie, so far, on only one-half of its.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Oregon Railway & Navigation Co., annual meeting, in Portland, Or., June 19. Transfer books close May 20.

Northern (*New Hampshire*), annual meeting, at the office in Concord, N.H., May 25. The stockholders will vote on the proposed consolidation with the Concord & Claremont Company.

Railroad Conventions.

The *Railway Car Accountants' Association* will hold its annual meeting in Boston, beginning on Tuesday, May 23, at 10 a. m. The Hotel Vendome has been selected as headquarters for members.

The *Master Car-Builders' Association* will meet in annual convention in Philadelphia, June 13.

The *Yardmasters' Association* will hold its annual convention in Baltimore, June 14.

The *Master Mechanics' Association* will hold its annual convention at Niagara Falls, beginning on June 20.

Dividends.

Dividends have been declared as follows:

Catawissa (leased to Philadelphia & Reading), 3½ per cent., semi-annual, on the preferred stock, payable May 17.

Boston & Maine, 4 per cent., semi-annual, payable May 15.

Iowa Falls & Sioux City (leased to Illinois Central), 1½ per cent., payable June 1.

Delaware & Hudson Canal Co., 1¾ per cent., payable June 10. Transfer books close May 20.

Foreclosure Sales.

The sale of the *Washington & Ohio* road, which was to have taken place May 16, has been postponed for 10 days by order of the Court. The order was made on petition of representatives of the Baltimore, Cincinnati & Western Company, who bought the road at the former sale, but failed to make the cash payment required. They now ask to be allowed to make good their purchase on the same terms as the former sale, and have 10 days given them in which to do it.

The Master Mechanics' and the Master Car-Builders' Associations.

The *Master Car-Builders' Association* will begin its sixteenth annual convention in Phila lelphia, on Tuesday, June 13. The Committee of Arrangements have selected the Continental Hotel as the headquarters of the Association during the meeting. Members wishing to engage rooms will communicate with the proprietor of the hotel.

The *American Railway Master Mechanics' Association* will hold its fifteenth annual convention at the International Hotel, Niagara Falls, beginning on Tuesday, June 20. Members are requested to secure rooms through the Chairman of the Committee of Arrangements, Mr. F. M. Wilder, Susquehanna, Pa., or through the Secretary of the Association.

JOINT MEETINGS OF THE TWO ASSOCIATIONS.

The following report has just been issued by the committee appointed at the last meeting of the Master Mechanics' Association:

To the American Railway Master Mechanics' Association:

Your Committee appointed to confer with a committee appointed from the Master Car-Builders' Association for discussion of the desirability of holding joint meetings of the two Associations, beg leave to report that the Joint Committee considered it desirable for the interests of the two societies to have their meetings held upon the same days and in the same place, and to that end recommend that a committee of three be appointed at the next annual meetings of each of the two associations with authority to decide upon a place of meeting for the year 1883. And we would also recommend that said committee designate one of the following cities as the place for the meetings for the year 1883: Saratoga, Niagara Falls, Indianapolis, Pittsburgh, or Chicago.

We also recommend that the second Tuesday in June be the time set for holding said meeting.

F. M. WILDER,
JAMES SEDGLEY,
WM. WOODCOCK,
Committee.

Passenger Railway Conductors' Life Insurance Company.

The eleventh annual meeting of this Association was held at the Girard House, Philadelphia, May 10, a number of delegates being present. The President delivered the usual address. The Secretary's report showed that there are now 1,167 members. The Treasurer's report showed that the amount paid to families of deceased members during the year ending Feb. 28, 1882, was $16,910, and that the total receipts were $18,733.07. An election for officers and directors was held and the usual routine business transacted.

On the following day the visiting delegates accepted the hospitalities of the passenger conductors of Philadelphia and vicinity and an excursion on the Delaware on the steamer "Champion." After visiting the shipyard at Chester, the League Island navy yard, Cramps' shipyards and other places of interest along the river, the visitors took a special train on the Narrow Gauge road to Atlantic City, and in the evening attended a banquet tendered by the managers of the Philadelphia & Atlantic City Railroad.

Passenger Pool Meeting.

A meeting was held at the Grand Pacific Hotel in Chicago May 11, in accordance with the following call from Commissioner Fink:

"At the meeting of the Joint Executive Committee, held April 26 and 27, a resolution was passed requesting me to call a meeting of the managing officers and general passenger agents of all lines east of Chicago and north of the Ohio River, at 11 a. m. on the 11th day of May, at the Grand Pacific Hotel, Chicago, to further consider the agreement for the division of passenger traffic. You are hereby invited to be present at the meeting. The object of the meeting is to consider further the details of the contract. The following questions will be considered:

"1. Whether the roads not represented at the meeting of April 26 and 27 will become parties to the agreement.

"2. To agree upon the percentage of the division of traffic. For this purpose statement No. 83 is submitted, showing the earnings of each road for the year 1881. The companies who do not think that the earnings for the year 1881 should be taken as the basis of division should submit their claim for increased percentage to the meeting to have it acted upon, or in case of disagreement, submitted to arbitration."

The following gentlemen were present: Messrs. John Newell and W. P. Johnson, Lake Shore; John C. Gault and H. C. Townsend, Wabash; J. N. McCullough and E. A. Ford, Pennsylvania Company, Pittsburgh, Cincinnati & St. Louis, Jeffersonville, Madison & Indianapolis and Vandalia lines; W. H. Prouty, H. M. Bronson, Indiana, Bloomington & Western; E. A. Waldron and G. W. Smith, Lake Erie & Western; W. B. Shattuc, Ohio & Mississippi; John Egan, Cincinnati, Indianapolis, St. Louis & Chicago; H. B. Ledyard and O. W. Ruggles, Michigan Central; G. B. Spriggs and W. M. Edgar, Great Western; T. M. Ferris and A. E. Clark, New York, Pennsylvania & Ohio; W. O. Hughart and A. B. Leet, Grand Rapids & Indiana; W. H. Hurlburt, Canada Southern; A. J. Smith, Indianapolis & St. Louis, Cleveland, Columbus, Cincinnati & Indianapolis, Cincinnati, Hamilton & Dayton; A. D. Smith, Pittsburgh & Lake Erie; C. P. Atmore, Louisville & Nashville; J. R. Mulliken and W. A. Carpenter, Detroit, Lansing & Northern; C. K. Lord, Baltimore & Ohio; J. R. Wood, Pennsylvania Railroad; T. Tandy, Detroit, Grand Haven & Milwaukee, and John J. Archer, Scioto Valley.

The meeting was called to order by Mr. J. N. McCullough. Mr. John Newell was chosen Chairman, and Mr. A. J. Smith, Secretary.

The entire day was spent in considering the original pool agreement as discussed in New York. All the roads present were willing to become parties thereto. The only roads that had signed the agreement before were the Michigan Central, Great Western, New York, Pennsylvania & Ohio, Grand Rapids & Indiana, Indianapolis & St. Louis, Pennsylvania, Lake Shore & Michigan Southern, Canada Southern, Cincinnati, Hamilton & Dayton, Cleveland, Columbus, Cincinnati & Indianapolis, Dayton & Union, Vandalia line, Detroit, Grand Haven & Milwaukee, Lake Erie & Western, Detroit, Lansing & Northern, Baltimore & Ohio, and Valley Railroad.

The following resolution was adopted:

"*Resolved*, That the General Passenger Agents of the lines represented at this meeting be a committee to consider the pool contract, and report at an adjourned meeting to occur May 12 any details they may regard as essential to the carrying out of the same."

It was decided that the pool shall take effect from May 1 instead of from April 1.

The meeting then adjourned until next day.

On the following day the general passenger agents met, with Mr. C. K. Lord in the chair and Mr. O. W. Ruggles, Secretary. The proceedings of the previous day were explained.

The pool contract was then further discussed, the deliberations continuing throughout the day.

One result of the discussion was that the contract was so amended that each line in interest shall have the right to maintain its standing as a through-passenger route between common centres, and shall be allowed to earn under this contract its share of the receipts based generally upon a division of the first and second-class passenger business of 1881, and that such division shall be ordered and maintained by the Commissioner from proper data.

A committee, consisting of Messrs. E. A. Ford, H. C. Townsend and A. F. Smith, was appointed to report at the next meeting upon the question of the basis for percentages of new lines and new portions of old ones. The following was carried:

"*Resolved*, That the Chairman of the Joint Executive Committee be requested to call a meeting at his office on Wednesday, May 24, 1882, for the specific purpose of executing the pool contract, and that all roads now present, and such other roads as may be willing to join in the execution of the contract, be invited to attend that meeting for that purpose; that at that meeting the contract be executed; that in the meantime the roads that intend to join the pool file with Commissioner Fink a statement of their earnings for 1881, with such arguments as they desire to present therewith."

The meeting then adjourned.

Western Association General Passenger and Ticket Agents.

This association met in Chicago, May 10, for the purpose of acting upon the several propositions for reforming the passenger business submitted by the Executive Committee. There were present B. F. Mills, Burlington, Cedar Rapids & Northern; W. H. Hurlbut, Canada Southern; E. L. Lomax, Chicago, Burlington & Quincy; William Hill, Chicago & Eastern Illinois; A. V. H. Carpenter, Chicago, Milwaukee & St. Paul; W. A. Thrall, Chicago & Northwestern; John Egan, Cincinnati, Indianapolis, St. Louis & Chicago; H. M. Bronson, Cincinnati, Sandusky & Cleveland; A. J. Smith, Cleveland, Columbus, Cincinnati & Indianapolis; Owen Rice, Cincinnati, Wabash & Michigan; E. P. Wilson, Cincinnati, New Orleans & Texas Pacific; F. Milligan, Detroit, Mackinac & Marquette; A. B. Leet, Grand Rapids & Indiana; J. H. Whitmore, Grand Trunk; W. H. Prouty, Indiana, Bloomington & Western; H. R. Deering, Jeffersonville, Madison & Indianapolis; George Washington Smith, Lake Erie & Western; W. P. Johnson, Lake Shore & Michigan Southern; T. P. Barry, Marietta & Cincinnati; O. W. Ruggles, Michigan Central; F. Chandler, Missouri Pacific; C. P. Atmore, Louisville & Nashville; A. E. Clark, New York, Pennsylvania & Ohio; W. B. Shattuc, Ohio & Mississippi; E. A. Ford, Pennsylvania Company; W. B. Anderson, Peoria, Decatur & Evansville; C. C. Cobb, Pittsburgh, Cincinnati & St. Louis; A. D. Smith, Pittsburgh & Lake Erie; H. C. Davis, St. Paul, Minneapolis & Manitoba; John J. Archer, Scioto Valley; J. M. Chesbrough, Vandalia; C. S. Stebbins, Union Pacific; H. C. Townsend, Wabash; and W. H. Dixon and J. R. Wood as honorary members. Mr. A. J. Smith occupied the chair and Mr. George H. Daniels acted as Secretary.

The first business taken up for consideration was the question whether round-trip land-exploring tickets should be issued to more than one point in each state and territory through which the road requesting them passes. After a long discussion it was resolved as follows:

"First. That from and after June 1, 1882, round-trip land-exploring tickets shall be issued or sold to no more than one point on any railway, and that said one point shall be named by said road; *provided*, however, that where a railway penetrates more than one state or territory, said railway may be allowed to name one point in each state or territory; and *provided*, further, that where a railway has two or more lines penetrating the same state or territory, it shall be allowed to name a point for each line, and that said tickets may be issued to the several points so named; and, *provided*, that if the point named by any line is reached by other and competing lines, such tickets may be issued over each one of such competing lines.

"Second. That no round-trip land or other round-trip ticket terminating at any Missouri River point, whether sold in connection with extension tickets or not, shall be sold or will be accepted by any of our respective roads after June 1, 1882.

"Third. That this association hereby adopts the ironclad form for round-trip land-exploring tickets sold to any land point, and that all such tickets shall be signed by the purchaser and witnessed by the ticket agent selling the same, and said ticket shall be made non-transferable. The contract in all round-trip, land-exploring tickets issued and sold after June 1, 1882, shall embody the provisions embraced in the form for said tickets adopted by the Western Association at its meeting held at St. Joseph, Mo., Nov. 11, 1879, and that the land-grant roads, or the roads for which these tickets are issued, hereby agree not to accept any tickets that do not conform to this resolution.

"Fourth. That the rates for such round-trip land-exploring tickets as may be issued in conformity with these resolutions shall be inserted in all the rate-sheets issued by this association, and in all the district rate-sheets issued within the territory of this Association.

"Fifth—That all round-trip land-exploring tickets, other than those referred to in these resolutions, shall be withdrawn from sale on or before June 1, 1882, and shall not again be placed on sale save by vote of this association.

"Sixth—That the Secretary ask each line in interest to name their points under these resolutions, and that points so named or published as only points to which round-trip exploring tickets shall be issued."

The question of adopting some uniform plan for conducting the theatrical business was then taken up and discussed at considerable length. The matter was not finally determined. It was virtually agreed, however, that the rate for theatrical parties should be 2 cents per mile, and that advance agents should be given half of the regular unlimited rates.

The question of adopting uniform rules in regard to baggage matters was referred to a committee of seven, consisting of C. P. Atmore, E. A. Ford, France Chandler, W. H. Hurlbut, C. S. Stebbins, W. H. Stennett and E. P. Wilson, with instructions to investigate the matter, find out what is needed and report to the next meeting, to be held on the second Wednesday in August.

The question of adopting some uniform plan for the tourist or excursion business, the advisability of abolishing the system of personally conducted excursions, the proposition that each road protect its connections from unfair discrimination in the event of their declining to pay commissions, and the question whether some rule cannot be adopted which will be uniform and just in regard to ticketing passengers through by long and circuitous routes to important points reached by direct and short lines—all these were laid over until the August meeting.

The subject of limits on tickets, or the abolition of the old style of limited tickets and the substitution therefor of a continuous passenger-train ticket, was then taken up.

The object of this change in the issue of limited tickets is forced upon the roads by the activity and ingenuity of the scalpers in handling regular limited tickets. It is believed that continuous passage train tickets, with proper restrictions and legal contracts, will prevent gamblers from dealing in such tickets.

Mr. E. P. Wilson, Chairman of the committee appointed at the meeting of the National Association in New York to propose a plan for the introduction of continuous-passage tickets in place of the regular limited tickets, submitted a form of contract, which he stated had been prepared with great care and submitted to the best legal authorities in the country.

Other forms of contracts, differing somewhat from the above, were also submitted. This subject engaged the attention of the meeting until a late hour in the evening and caused quite an animated discussion. Pending the discussion of this matter, the meeting adjourned until next day morning. Before adjourning, it was resolved to hold the next meeting at Detroit on the second Wednesday in August.

On the following day the discussion on limited tickets was continued. No final action was taken, and the matter was finally postponed until the August meeting.

ELECTIONS AND APPOINTMENTS.

Ashuelot.—At the annual meeting, May 9, the following directors were chosen: Oscar Edwards, A. B. Harris, W. H. Haile, E. F. Lane, F. F. Lane, J. Mulligan, James A. Rumrill. The board elected A. B. Harris President; F. F. Lane, Clerk; E. F. Lane, Treasurer; George E. Frink, Auditor. The road is worked by the Connecticut River Company.

Augusta & Knoxville.—At the annual meeting in Augusta, Ga., recently, the following directors were chosen: J. H. Alexander, J. V. H. Allen, J. W. Clark, Charles Estes, Henry Franklin, Z. McCord, R. H. May, W. C. Sibley, M. A. Stovall, E. F. Verdery, W. B. Young, of Georgia; A. M. Aiken, P. H. Bradley, C. M. Burkhalter, J. C. Maxwell, R. H. Middleton, J. D. Neal, T. F. Riley, of South Carolina. The board elected E. F. Verdery President; P. H. Bradley, Vice-President; M. V. Calvin, Secretary; John W. Clark, Treasurer; A. J. Twiggs, Chief Engineer and Superintendent.

Boston, Hoosac Tunnel & Western.—Mr. F. L. Ames having declined, the board has elected Ginery Twichell President.

Buffalo, Cayuga Valley & Pine Creek.—This company has been organized with the following directors: H. T. Foster, R. D. Smith, H. C. Sargent, Marilla, N. Y.; L. H. Brown, W. L. Hawes, W. N. Martin, Wm. B. Perry, Bennington, N. Y.; Alpheus George, Charles Schwab, O. L. Tozier, Sheldon, N. Y.; T. E. Bliss, G. R. Morgan, A. G. Neely, Wethersfield, N. Y. The board elected O. L. Tozier President; H. T. Foster, Vice-President; F. E. Bliss, Secretary; W. L. Hawes, Treasurer.

Central Pacific.—The following additional appointments and promotions are announced: C. F. Smurr, First Assistant General Freight Agent in place of Richard Gray, promoted; J. M. Crawley, Second Assistant General Freight Agent; J. B. Wright, Superintendent of Sacramento and Oregon divisions, California Pacific Railroad and Northern Railroad (north of Benicia), in place of R. H. Pratt, appointed Assistant General Superintendent; J. A. Muir, Assistant Superintendent Sacramento and Oregon divisions.

Cheshire.—At the annual meeting last week the following directors were chosen: Wm. H. Hill, Jr., John B. Meer, Royal M. Pulsifer, George W. Russell, Wm. A Russell, Edward C. Thayer, Aurelius B. Turner. The board elected Wm. A Russell President; Edward C. Thayer, Vice-President; R. Stewart, Clerk.

Chicago, Burlington & Kansas City.—Mr. H. H. Trimble has been appointed General Solicitor, with office in Keokuk, Iowa.

Connotton Valley.—At the annual meeting, May 12, the

following directors were chosen: Samuel Allen, Dell Roy, O.; Isaac H. Taylor, Carrollton, O.; E. D. Bishop, W. W. Hungerford, Wm. A. Lynch, Canton, O.; M. Watts, Thomaston, Me.; Wm. O. Chapman, Canton, Mass.; Cyrus Wakefield, Wakefield, Mass.; Wm. Rotch, Wm. J. Rotch, New Bedford, Mass.; John A. Beebe, Francis Bartlett, Sidney Bartlett, Albert N. Parlin, Joseph B. Thomas, Boston. The board elected Francis Bartlett President; Wm. Rotch, Secretary.

Gainesville, Jefferson & Southern.—At the annual meeting, May 4, the following were chosen: President, Allen D. Candler, Gainesville, Ga.; directors, John R. Hosch, Hoschton, Ga.; D. R. Lyle, Mulberry, Ga.; N. J. Kelly, Jug Tavern, Ga.; H. W. Bell, W. C. Howard, F. L. Prendergrass, Jefferson, Ga.; J. R. Boone, S. C. Dunlap, R. E. Green, J. E. Redwine, C. C. Sanders, W. P. Smith, Gainesville, Ga.

Hannibal Union Depot.—Mr. J. Finley McDoel has been appointed Superintendent and Ticket Agent of the Union Depot at Hannibal, Mo. He has been for several years a passenger conductor on the St. Louis, Keokuk & Northwestern road.

Hanover Junction, Hanover & Gettysburg.—At the annual meeting, May 9, the following were chosen: President, A. W. Eichelberger, Hanover, Pa.; directors, Peter Flickinger, Wm. Grumbine, Stephen Keefer, R. M. Wirt, Henry A. Young, Reuben Young, Hanover, Pa.; Matthew Eichelberger, David Wills, Gettysburg, Pa.; Wm. Buehler, Charles W. Slagle, Baltimore.

Little Rock, Mississippi River & Texas.—At the annual meeting recently the following directors were chosen: L. A. Pindall, Arkansas City, Ark.; J. T. W. Tillar, Selma, Ark.; V. D. Wilkins, Pine Bluff, Ark.; D. E. Jones, C. F. Penzel, Little Rock, Ark.; J. E. Redfield, Essex, Conn.; E. H. Winchester, Portsmouth, N. H.; Elisha Atkins, F. Gordon Dexter, Boston. The board re-elected Elisha Atkins President; J. A. Woodson, Secretary and General Superintendent; G. S. Daniels, Treasurer; H. G. Allis, Auditor and General Passenger Agent; G. W. Hughes, Chief Engineer.

Louisville, Evansville & St. Louis.—The board has elected Isaac T. Burr and Wm. B. Strong directors to fill vacancies made by resignation. They represent the Boston interest in this road, which is considerable. Mr. Strong is well known as President of the Atchison, Topeka & Santa Fe Company, and Mr. Burr is a director of the same company.

Marquette, Houghton & Ontonagon.—Mr. W. A. Thompson is appointed Road-Master, with office at Marquette, Mich.

Mexican Central.—The following circular is dated Boston, May 10:

"Mr. F. L. Parker is appointed General Freight and Passenger Agent of this company, in charge of the traffic of its Chihuahua Division, with office at Paso del Norte, Mexico. Appointment takes effect June 1, 1882."

Milford, Franklin & Providence.—The officers of this new company are: President, James P. Ray; Vice-President, Wm. F. Draper; Clerk, George W. Wiggin; Treasurer, Joseph G. Ray. Office in Franklin, Mass.

Montreal & Vermont Junction.—At the annual meeting last week the following directors were chosen: J. S. Brigham, J. P. Clark, A. S. Gilmour, J. D. Hatch, E. C. Smith, G. G. Smith, J. Gregory Smith.

Mt. Washington.—At the annual meeting in Concord, N. H., last week, the following directors were chosen: Walter Aiken, Joseph A. Dodge, John H. George, Sylvester Marsh, Emmons Raymond, J. Thomas Vose, Nathaniel White, Jr. The board elected Sylvester Marsh President: Frank E. Brown, Clerk; E. D. Harlow, Treasurer; Walter Aiken, Joseph A. Dodge, Joint Managers.

New York & Harlem.—At the annual meeting in New York, May 16, the following directors were chosen: Abraham B. Baylis, James H. Banker, Samuel F. Barger, John E. Burrill, Chauncey M. Depew, John B. Dutcher, Joseph Harker, Wm. H. Leonard, Robert J. Niven, Augustus Schell, Cornelius Vanderbilt, Wm. H. Vanderbilt, Wm. K. Vanderbilt. The board elected Wm. H. Vanderbilt President; Cornelius Vanderbilt, Vice-President; E. V. W. Rossiter, Treasurer. The road is leased to the New York Central & Hudson River Company.

Norfolk & Western.—The following circular from First Vice-President F. J. Kimball is dated Philadelphia, Pa., May 9:

"The New River Railroad Company, the New River Railroad Company of West Virginia, and the East River Railroad Company, having this day consolidated with the Norfolk & Western Railroad Company, all the work of construction will from this date be under the supervision of W. W. Coe, Chief Engineer, office at Roanoke, Va.

"The roads thus consolidated with the Norfolk & Western Railroad Company will be known as the New River Division of the Norfolk & Western Railroad Company.

"That portion of the line north of New River Bridge will be under the immediate direction of John Graham, Jr., Engineer in charge, office at Pearisburg, Giles County, Va., who will report to W. W. Coe, Chief Engineer.

"That portion of the line south of New River Bridge will be known as the Cripple Creek Extension (New River Division), and will be under the immediate direction of J. H. Wingate, Engineer in charge, office at Wytheville, Va., who will report to W. W. Coe, Chief Engineer."

Passenger Railway Conductors' Life Insurance Co.—At the annual meeting in Philadelphia, May 10, the following officers were chosen for the ensuing year: President, T. C. Jones, Toledo, O.; Vice-Presidents, C. H. Wilsey, Toledo, O.; A. A. Sharp, Macon, Ga., and George Mogford, Jackson, Mich.; Secretary and Treasurer, Walter Lackey, Philadelphia; non-resident directors, R. Hogland, Louisville, Ky.; J. F. Peyton, Lynchburg, Va.; A. F. Barrett, Winona, Minn.; J. F. Conant, Cincinnati; resident directors, W. H. Lummis, Charles Parker, James Gordon, W. R. Kenney, J. A. Southwick, Philadelphia.

Pensacola & Perdido.—At the annual meeting in Pensacola, Fla., May 3, the following directors were chosen: Henry Baars, W. A Blount, B. F. Brent, W. K. Hyer, B. F. Simmons. The board re-elected B. F. Simmons President and Superintendent; H. W. Simmons, Secretary and Treasurer.

Pennsylvania Railroad Leased Lines.—In Pittsburgh last week the following officers were chosen for this company's leased lines: *Pittsburgh, Virginia & Charleston.*—President, J. N. DuBarry; directors, Geo. B. Roberts, Edmund Smith, Wistar Morris, John P. Green, Strickland Kneass, D. A. Stewart, Chas. E. Speer, W. J. Howard, Geo. V. Lawrence, John Scott, Thos. L. Daly, Joseph Walton; Secretary and Treasurer, D. P. Corwin. *Camden & Burlington County.*—John S. Irick, President; Job H. Gaskill, Richard C. Shreve, H. B. Smith, Isaac S. Buckalew, Clifford S. Sims, William Budd Deacon, Floyd Armstrong, William H. Gatzmer, George W. South, Richard Ashhurst, John C. Sims, Jr., N. J. DuBarry, Edmund Smith, Strickland Kneass, directors.

Portage, Westbourne & Northwestern.—Mr. John Ortton has been appointed General Superintendent of this Manitoba road. He is now Superintendent of the Car Department of the Canada Southern road.

Port Huron & Northwestern.—Mr. E. D. Kendall has been appointed Train Dispatcher and Chief Operator, with office at Port Huron, Mich., in place of E. F. Wellington, resigned.

Pullman Southern Car Co.—At the annual meeting in Louisville last week the following directors were chosen: George F. Brown, Rufus B. Bullock, M. Burns, W. C. Hall, W. F. Harris, W. C. Hite, George M. Pullman, A. M. Quarrier, E. D. Standiford. The board elected George M. Pullman President; George F. Brown, Vice-President; W. C. Hite, Second Vice-President; A. F. Weinsheimer, Secretary; Thomas H. Hays, General Superintendent.

Reading, Marietta & Hanover.—The officers of this company are: President, Samuel Eby; directors, Thomas Baumgardner, Abram Collins, Franklin B. Gowen, Henry Hiestand, J. N. Hutchinson, G. A. Nichols; Secretary and Treasurer, J. N. Hutchinson.

St. Louis, Keokuk & Northwestern.—Mr. H. H. Trimble has been appointed General Solicitor, with office in Keokuk, Iowa.

Sinaloa & Durango.—Mr. James D. Schuyler has been appointed Chief Engineer and General Superintendent, with office at Culiacan, Mexico, in place of Mr. Edward P. North, who has returned to the United States, but still continues in the company's service.

PERSONAL.

—Mr. J. T. Odell has withdrawn his resignation and will continue Superintendent of the Chicago, Texas & Mexican Central road.

—Mr. Charles Miller has resigned his position as Division Engineer on the Salamanca Extension of the Buffalo, Pittsburgh & Western road.

—Mr. R. W. Ware has resigned his position as Engineer and Road-Master of the Delaware division of the New York, Lake Erie & Western road.

—Messrs. Edward Cummings, Bluford Wilson and Bennett H. Young have resigned their positions as directors of the Louisville, Evansville & St. Louis Company.

—Mr. David F. Bound has resigned his position as Road-Master of the Atchison, Topeka & Santa Fe at San Marcial, N. M., and has returned to his home at Shickshinny, Luzerne County, Pa.

—Mr. E. F. Wellington recently resigned his position as Train Dispatcher of the Port Huron & Northwestern road. The trainmen on the road presented him with a valuable Masonic jewel as a mark of their esteem.

—Mr. Ephraim Murdock, Jr., an old citizen of Winchenden, N. H., died May 8 at his residence in that town. He was a director of the Cheshire Railroad Company for 35 years, and President of the company for 15 years.

—Mr. Charles E. Pugh, General Superintendent of the Pennsylvania Railroad Division of the Pennsylvania Railroad, has gone to Europe for several months, having received leave of absence on account of ill health.

—Mr. Edward P. North, late Chief Engineer and General Superintendent of the Sinaloa & Durango Railroad, arrived in New York from Mexico last week. He is at present in Boston, where the headquarters of the company are.

—Mr. J. W. Wallace has resigned his position as Freight Claim Agent of the Missouri Pacific and leased lines, in order to take charge of the accounts of the estate of the late Thomas Allen, which is an extensive and somewhat complicated property.

—Hon. Thomas H. Whitney, for many years a director of the West Jersey Company, died very suddenly at his residence in Glassboro, N. J., May 4. He was a man of large wealth and influence, and represented his district in Congress some 30 years ago.

—Mr. George F. Williams died in Boston, May 6. He had been for a number of years a director of the Cheshire Railroad Company. Four directors of this company (out of a board of only seven members) have died during the past year, two within a few days.

—Mr. L. B. Stillson has resigned his position as Superintendent of the Housatonic Railroad, to take effect May 15. He has been on the road for many years, beginning as trainboy and working his way up gradually through the various gradations to be Superintendent.

—Mr. St. John Boyle has resigned his position as Vice-President and a director of the Louisville, Evansville & St. Louis Company. It is reported that his resignation has been caused by a difference of opinion as to the expediency of building a new bridge across the Ohio at Louisville.

—Mr. John F. Hosch, an old railroad contractor, died at his home in Mohawk, N. Y., May 11, aged 52 years. He had held large contracts in Massachusetts, Illinois and Georgia, and at the time of his death had a contract for grading a section of the New York, West Shore & Buffalo road.

—Mr. C. D. W. Young, Auditor of the Chicago, St. Paul, Minneapolis & Omaha Company, was drowned in White Bear Lake, Minn., May 14. He had gone out sailing with several companions, when a squall came up. The boat did not return, but some pieces of it and several hats were thrown up on the shore, and it is believed that all of the party were drowned.

—Dr. Devillo White, an old and much respected physician, and a man of large property, died at his residence in Sherburne, N. Y., May 10, aged 81 years. He took an active part in the promotion and building of the Utica, Chenango & Susquehanna Valley Railroad, and was a member of its board of directors from its first organization to his death.

—It is reported (and is true) that a number of the stockholders and directors of the Louisville & Nashville Company have offered the presidency of that company to Trunk Line Commissioner Albert Fink, on terms and under circumstances that make the offering tempting to him. In case of his acceptance he is to have entire charge of the operation and management of the road and its controlled lines. Mr. Fink is thoroughly familiar with the Louisville & Nashville, having served for a number of years as its General Superintendent, and having in that position first made his reputation. It is not probable, however, that he will be permitted to leave his present position, if the almost universal desire of the railroad managers of the country can avail to keep him there.

—The officers and employés of the Mt. Clare shops of the Baltimore & Ohio road recently presented Mr. John C. Davis with a valuable horse and wagon, as a testimonial of their esteem for him, and their regret at his retirement from the position of Master of Machinery. The presentation was made at the shops, and was a complete surprise to Mr. Davis, who responded in an appropriate manner to his old friends and associates.

Mr. Davis entered the service of the Baltimore & Ohio Railroad Company in 1840, as a journeyman machinist in the road department. About 1844 he entered the machinery department, and was promoted to different positions until he reached that of Master Mechanic. He left the service of the Baltimore & Ohio Company in 1853, and entered that of the Baltimore & Susquehanna Company (now the Northern Central), where he remained until 1860. From 1860 to the outbreak of the war, in 1861, Mr. Davis was in the employ of Mr. Ross Winans, traveling, and looking after Mr. Winans' patents. When the war broke out he went on a farm which he owned in Baltimore County, and in the fall of 1862 accepted the position of Master of Machinery of the Eastern Division of the Ohio & Mississippi, with headquarters at St. Louis. He left this service to enter that of the Western Maryland road, in the winter of 1863, where he remained until he was again called to the service of the Baltimore & Ohio road as Master of Machinery, in 1865, and which position he filled until March 1, 1882, when he was succeeded by Mr. N. E. Chapman.

—Mr. William Abbott, a London stockholder, who conducted the contest against the old Great Western board and in favor of a union with the Grand Trunk, at the half yearly meeting in London, April 27, spoke as follows of the new board of directors, which he then proposed and which was afterwards elected:

"Now, gentlemen, I will read to you the board, which I have, with considerable trouble, in concert with my friends in London, who are some of the largest shareholders (not speculators)—bona-fide shareholders—got to accept the position. I propose as President the Right Hon. Viscount Bury. Now, in selecting a board I was anxious to get men who were qualified to carry out the agreement offered by the Grand Trunk Company, so as to give the largest amount of benefit immediately, and, therefore, they must be possessed of railway experience. Lord Bury was Superintendent-General of Indian Affairs; Civil Secretary for Canada in 1856, under Lord Elgin and Sir E. Head; fifteen years a director of the London & Southwestern; and a member of the joint committees of the Southwestern and Brighton, and of the Southwestern and Great Western, so that he has had vast experience of what is to be done in competitive traffic—the very experience so valuable on this board. Another gentleman I have selected is Mr. H. Doughty Browne, Deputy-Chairman of the London, Tilbury & Southend Railway, and perhaps it would ill become me to say anything about him, since he is a gentleman thoroughly well able to speak for himself, and everyone who has ever come in contact with him in business knows him to be a man of honor and uprightness, and there is not the slightest fear of any aspersion being cast upon him. The next is Col. E. Chaplin, a director of the Great Northern Railway. I dare say Mr. Maclure knows something about him, in his relations with the Sheffield & Great Northern Railway, and I think he will know that Col. Chaplin won't come under the denomination of being either friendly or unfriendly. The next is Mr. J. Charles, a director of the Great Eastern; then Major Dickson, M. P., one of the directors on my old friend the London, Chatham & Dover Railway. I will ask Mr. Morris whether it is necessary to have five or six directors on the board. (Mr. Morris: Six.) I like to have as small a board as you can possibly make it. Well, then, the other gentleman I have here is Mr. John Marnham, of Boxmoor, a gentleman who has had the interest of the company at heart for many years. He is a large holder of stock, and a gentleman retired from business, and can give a great deal of time to it as a labor of love, which will enable him to discharge this duty cheerfully."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1882.	1881.	Inc. or Dec.		P.c.
Four months ending April 30:					
Ala. Great Sout'n.	$253,197	$242,813	I.	$10,384	4.3
At., Top. & S. F...	4,347,000	3,151,000	I.	1,196,000	37.9
Central Iowa.....	361,125	226,471	I.	134,654	59.5
Ches. & Ohio	857,105	802,752	I.	54,353	6.8
Chi. & Alton.....	2,246,996	2,061,543	I.	185,453	9.0
C., I., St. L. & C..	817,813	728,684	I.	89,129	12.1
Flint & Pere M....	713,275	583,370	I.	129,905	22.3
Grand Trunk	3,411,563	3,473,119	D.	61,556	1.7
G. B., W. & St. P.	118,949	102,196	I.	16,744	16.4
Minn. & St. L.....	438,684	236,081	I.	202,603	85.8
Ohio Central.....	290,466	167,028	I.	123,438	73.9
Or. Ry. & Nav. C.	1,463,300	987,513	I.	475,787	48.2
Net earnings ...	643,310	375,010	I.	268,300	71.5
Wisconsin Cen....	617,653	402,024	I.	215,629	53.6
Three months ending March 31:					
Atlantic & N. C. ..	$30,662	$28,313	I.	$2,349	8.3
Net earnings....	8,091	.....	.....	.....	....
Bur.,Ced. R. & No.	702,560	440,810	I.	261,750	59.4
Net earnings....	266,621	86,100	I.	180,521	209.6
Chi., B. & Quincy.	4,682,351	3,760,918	I.	921,433	24.5
Net earnings....	2,000,565	1,558,509	I.	442,556	28.4
Des M. & Ft. D....	100,372	68,380	I.	31,892	46.9
Net earnings ...	44,442	5,525	I.	38,917	704.4
European & N. A.	118,805	103,831	I.	14,974	14.4
Net earnings....	64,063	11,850	I.	52,213	440.6
Louisv. & Nash...	2,999,842	2,570,044	I.	429,798	16.7
Net earnings....	1,230,354	813,427	I.	416,927	51.3
Norfolk & West...	493,000	514,200	D.	21,200	4.1
Net earnings....	187,237	221,649	D.	34,412	15.5
Month of March:					
Chi., R. & Quincy.	$1,566,217	$1,418,149	I.	$148,068	10.4
Net earnings	619,151	639,626	D.	20,475	3.2
Norfolk & West...	174,769	.....		.....	....
Net earnings	67,161	.....		.....	....
Month of April:					
Ala. Great Sout'n.	$57,005	$58,259	D.	$1,252	2.1
At., Top. & S. F. .	1,100,000	948,000	I.	152,000	16.0
Central Iowa.....	82,044	76,186	I.	5,858	7.7
Ches. & Ohio.....	253,861	227,342	I.	26,519	11.7
Chi. & Alton.....	561,787	558,190	I.	3,597	0.6
C., I., St. L. & Chi.	204,269	183,710	I.	20,559	11.2
Flint & Pere Mar..	188,129	168,520	I.	19,609	11.6
G. B., W. & St. P.	31,291	32,312	D.	1,021	3.2
Minn. & St. L.....	93,672	75,032	I.	18,590	24.7
Ohio Central.....	84,448	35,455	I.	48,993	138.0
Or. Ry. & Nav. C.	379,200	379,205	D.	5	....
Net earnings....	165,300	220,535	D.	55,235	25.0
Vick. & Meridian.	30,716	35,080	D.	4,364	12.5
Wisconsin Cent...	158,538	123,765	I.	34,773	28.1
First week in May:					
Chi. & East. Ill....	$33,671	$29,324	I.	$4,347	15.0
Chi. & Gd. Trunk.	40,681	18,715	I.	21,966	117.6
Chi., Mil. & St. P.	359,000	315,683	I.	43,317	14.1
Mo. Pac. lines...	498,203	420,844	I.	77,359	18.4
Northern Pacific.	127,060	70,610	I.	56,450	79.9
Union Pacific.....	485,000	292,000	I.	193,000	66.1
Wab., St. L. & P.	283,501	222,747	I.	60,754	27.2
Second week in May:					
Denver & R. G...	$149,425	$115,257	I.	$34,168	29.7

Grain Movement.

For the week ending May 6, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past six ye .rs.

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P. c. of total.	Atlantic receipts
1877....	2,853,906	2,525,207	1,214,861	48.1	2,684,629
1878....	4,369,785	4,822,441	1,901,939	39.5	5,704,275
1879....	3,559,963	4,175,308	1,664,849	39.9	4,450,571
1880....	4,632,478	4,578,081	1,884,501	41.1	2,893,203
1881....	3,706,623	4,974,840	1,503,111	30.2	3,100,544
1882 ...	3,648,304	3,127,605	1,082,503	34.6	2,944,216

The receipts of the Northwestern markets were nearly as large this year as last, but they are a little less than the week before. The shipments of these markets were 37 per cent. less than last year and smaller than in any corresponding week since 1877. Though navigation was open but four days of the week last year and the whole of the week this year, 3,105,844 bushels went by lake last year, and but 1,926,245 this. So also the shipments down the Mississippi during the week were 365,895 bushels last year, to 118,857 this. The decrease in water shipment is 41 per cent.; in rail shipments, 28 per cent. The latter, however, are the smallest since the second week of May last year, and with that exception the smallest since 1879. The receipts of Atlantic ports are but little less than in the corresponding week of last year, and more than in the corresponding week of 1880. They are no less than 1,038,000 bushels (54 per cent.) more than the week before, and are the largest since last November, due doubtless to the full renewal of canal receipts at New York. There have seldom been receipts by canal so early.

Of the Northwestern receipts, Chicago had 51.4 per cent., St. Louis 18, Peoria 9.5, Toledo 9.3, Milwaukee 5.1, Detroit 4.5, Cleveland 1.8, and Duluth 0.4 per cent. Though there is a decrease of 350,000 bushels from the previous week in the total receipts, there is a gain at Chicago. The two interior points, St. Louis and Peoria, which received 37 per cent. of the whole during the first five months of the year, now seem to feel the competition of the lake and canal route, and in the first week of May received but 27½ per cent. of the whole.

Of the receipts of Atlantic ports New York received 57.6 per cent., Boston 19.5, New Orleans 8.3, Philadelphia 7.6, Baltimore 5.3, Portland 1.2 and Montreal 0.5 per cent. There was a gain, compared with the previous week, of 738,000 bushels (77 per cent.) at New York, of 242,000 (73 per cent.) at Boston, and of 136,000 bushels (127 per cent.) at New Orleans. Philadelphia and Baltimore had decreases.

Exports for the week ending May 9 were 551,827 bushels of grain and 26,006 barrels of flour this year, against 3,371,309 bushels of grain and 73,411 barrels of flour last year.

San Francisco exports for the ten months of the California crop year from July 1 to April 30 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1881-82.	1880-81.	Increase.	P. c.
Flour	741,010	733,695	207,315	38.8
Wheat	32,578,048	19,942,122	12,635,926	63.4
Total	36,283,098	22,610,597	13,672,501	60.5

Wheat shipments to France and Belgium have been 18.6 per cent. of the total this year; 80.5 per cent. went to Great Britain. Great Britain also took 54.1 per cent. of the flour, and China 29.1 per cent.

Shipments of California barley by sea for the ten months were 87,569 centals, a decrease of 81.7 per cent. from last year. Overland shipments to March 31 were 141,284 centals.

For the week ending May 13 receipts and shipments at Chicago and Milwaukee were:

	Receipts. 1882.	Receipts. 1881.	Shipments. 1882.	Shipments. 1881.
Chicago	1,406,847	1,318,144	1,937,808	1,915,893
Milwaukee	164,899	236,367	119,324	279,123
Total	1,571,746	1,554,511	2,057,132	2,195,016

The totals are nearly the same this year as last, but they were small last year.

For the same week ending May 13 receipts and shipments at Buffalo were:

	Receipts.	Shipments.
By rail	220,900	534,200
By water	1,181,800	749,415
Total	1,402,700	1,283,615

As usual, the railroads have been better able to compete with the canal than with the lake. They carried 42 per cent. of the Buffalo shipments, but only 16 per cent. of the Buffalo receipts.

For this week ending May 13, receipts at four Eastern ports were:

Bushels.	New York.	Boston.	Phila.	Baltimore.	Total.
1882....	1,557,814	301,365	135,500	190,606	2,185,285
1881....	1,752,759	324,100	303,650	285,039	2,665,548
1880. .	3,668,874	188,991	547,700	281,175	4,686,740
P. c. of total:					
1882.....	71.3	13.8	6.2	8.7	100.0
1881.....	65.8	12.1	11.4	10.7	100.0
1880.....	78.3	4.0	11.7	6.0	100.0

This year 1,033,300 bushels, or 66⅔ per cent., of the New York receipts were by canal; last year the receipts were all by rail; in 1880 about 3,000,000 bushels of the receipts were by canal, being the first week of arrivals.

Coal Movement.

Coal tonnages for the week ending May 6 are reported as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Anthracite	399,330	627,192	D. 227,862	36.3
Semi-bituminous	79,134	109,434	D. 30,300	27.7
Bituminous, Penna	72,758	46,208	I. 26,550	57.7
Coke, Penna	56,793	45,670	I. 10,123	23.0

The situation in the Cumberland Region is unchanged, though it is thought that the refusal of the Clearfield miners to strike will have some effect.

The Pottsville *Miners' Journal* says of the anthracite trade: "The demand for lump, steamboat, broken and pea sizes is sufficient to take up all of these sizes that can be produced during weeks of suspension. The domestic sizes are also improving in demand, but are not brisk. No arrangements have been made as yet for any further suspension of mining after this week, but the general feeling is that full time cannot be worked under present condition without seriously threatening the interests of the trade for the remainder of the year. The desire for full time is very natural, but the limiting of work by the companies to three days a week, does not and never has effected a loss of half time, nor reduced the tonnage on such weeks 50 per cent. A great many collieries do not suspend work at all. It is believed that even with the slight reduction if the output by the half-week suspensions is continued throughout this month there will be no need of any further stoppage for the remainder of the year."

The coal tonnage of the Pennsylvania Railroad for the week ending May 6 was: Coal, 162,826; coke, 56,793; total, 219,619 tons. The total tonnage this year to May 6 was 3,813,502 tons.

The official report from the Nova Scotia mines gives the amount of coal mined and sold for the quarter ending March 31 as follows:

	1882.	1881.	1880.
Tons mined	196,884	139,644	101,526
Tons sold	111,710	103,990	58,123

The increase in the total output this year over 1881 is 57,240 tons, or 40.9 per cent.; over 1880, 95,358 tons, or 93.9 per cent.

The Official Accountant's statement of anthracite tonnage for April and the four months ending April 30, differing somewhat in form from the weekly reports, is as follows:

	April. 1882.	April. 1881.	Four months. 1882.	Four months. 1881.
Phila. & Reading	514,158	480,602	1 778,745	1,805,010
Lehigh Valley	435,541	403,682	1,577,836	1,598,318
Central, of New Jersey	344,009	274,113	1,150,899	1,171,889
Del., Lacka. & West.	312,211	286,483	1,212,952	1,278,837
Del. & Hud. Canal Co.	216,572	197,193	879,728	961,473
Pennsylvania R. R. Co.	181,168	187,674	627,685	628,754
Pennsylvania Coal Co.	108,054	87,952	368,363	374,384
N. Y., Lake Erie & West.	24,090	28,156	70,508	143,851
Total	2,135,803	1,945,855	7 666,716	7,962,516

Increase for the month 189,948 tons, or 9.8 per cent.; decrease for the four months, 295,800 tons, or 3.7 per cent. For the month all the companies show gains except the Pennsylvania Railroad and the New York, Lake Erie & Western. For the four months all the companies show a decrease.

The stock of coal on hand at tidewater shipping points, April 30, was 752,865 tons; on March 31, 666,318 tons; increase, 86,547 tons during the month.

The anthracite companies have agreed to stop mining six days in all, three days in the last of this month and three in the first week of June.

The coal tonnage of the Chesapeake & Ohio Railroad for the four months ending April 30 was as follows:

	1882.	1881.	Increase.	P. c.
Coal	263,488	231,304	32,184	13 9
Coke	34,074	24,043	10,031	41.8
Total	297,562	255,347	42,215	16.5

April tonnage was 75,029 tons, of which 25,721 tons were brought to Richmond for shipment by water.

Chicago coal receipts for the trade year ending April 30 were as follows:

	By rail. 1881-82.	By rail. 1880-81.	By lake. 1881-82.	By lake. 1880-81.
Anthracite	431,919	420,767	598,913	379,367
Bituminous	2,173,429	1,751,355	292,892	236,403
Total	2,605,348	2,171,922	891,805	615,770

The total receipts last year were 2,466,321 tons bituminous and 1,030,832 tons anthracite, 3,497,153 tons in all; total the preceding year, 1,987,758 tons bituminous and 799,934 tons anthracite, 2,787,692 tons in all, the total increase being 709,461 tons, or 25.4 per cent. The most notable feature was the large increase in receipts of anthracite by lake.

Chicago and Milwaukee Receipts.

For the two weeks ending May 19 receipts have been for four successive years:

	1879.	1880.	1881.	1882.
Chicago:				
Grain, bush	3,848,437	5,074,611	2,865,443	3,374,546
Flour, bbls.	128,930	113,781	103,336	108,459
Hogs, No	192,249	252,378	217,785	227,731
Milwaukee:				
Grain, bush	1,044,712	636,073	488,012	550,204
Flour, bbls.	85,322	84,065	87,790	128,774
Hogs, No	7,028	9,901	11,389	16,848

The grain receipts at Chicago are half a million more than last year, but 2,500,000 less than in 1880; at Milwaukee they are a third less than last year and still less than in the other two years. Hog receipts, notwithstanding the short supply of corn in farmers' hands (or perhaps on account of it) keep up well; since February they have been considerably larger than last year.

The aggregate receipts at both places of flour (reduced to bushels) and grain for the two weeks have been:

Week to—	1879.	1880.	1881.	1882.
May 7	3,188,208	3,539,347	2,125,698	2,700,822
" 14	2,669,115	3,661,644	2,087,824	2,100,476
Two weeks	5,857,323	7,200,991	4,213,522	4,801,298

The increase over last year was thus almost wholly in the first week of the month. May, however, was a very unfavorable month for receipts last year. The spring opened so late that the farmers were kept busy in their fields and were unable to market their surplus as freely as usual until June. Thus April, May and June receipts of grain alone at Chicago and Milwaukee have been:

	1880.	1881.	1882.
April	5,305,494	5,451,144	5,305,223
May	16,044,579	8,641,775	.....
June	16,974,955	24,183,761	.....
Total	38,325,028	38,276,680	.....

We see that in 1880, when the winter had been mild and navigation opened early, as this year also, the receipts were *three times as great* in May as in April, the farmers' work has been done in April to such an extent as to enable them to give time to marketing their crops in May, and in spite of the heavy movement of the previous months, they had still a great deal to sell. Last year, though the severe winter had somewhat reduced shipments, and the farmers had a larger proportion of their grain on hand, they were not able to market in May as they did the year before, and though their April shipments were 146,000 bushels *more* than in 1880, the May shipments were 7,400,000 (46 per cent.) *less*; but the deficiency in May was made up in June, and the Chicago and Milwaukee receipts for the three months were nearly the same both years. This year the farmers' spring work is much more advanced than last year, but less so than in 1880. Putting in corn will engage their attention pretty closely throughout May (a great deal of corn is planted as late as the first of June in the latitude of Chicago when circumstances prevent earlier planting), but with fair weather they will probably have time enough, at least as far south as Southern Iowa and Central Illinois, to market all the grain they have to spare.

Cotton Rates.

Under the new tariff on cotton, which took effect May 8, the rates on uncompressed cotton, with the privilege to carrier of compressing, originating at points named below to New York, with usual differences to other seaboard cities, will be as follows: Memphis, 57; St. Louis and Hannibal, 49; East St. Louis and East Hannibal, 45; Cairo, Ill., 47; Evansville, 45; Louisville, Jeffersonville and New Albany, 43; Cincinnati, 40. The foregoing rates must be strictly maintained, as they are made according to agreement with the Southern routes.

On and after May 15 the trunk lines will not allow any cotton to pass their Western termini that is not billed at the full proportion of the tariff rates.

Tennessee Iron Ore.

During the month of April the Nashville, Chattanooga & St. Louis road carried to the furnaces at South Pittsburgh and Cowan, Tenn., 19,050 tons of iron ore. The total shipments of iron ore over the road for the four months ending April 30 were 71,200 tons, chiefly from the neighbourhood of Chattanooga.

Green Line Meeting.

A meeting of representatives of the roads in the Green Line was held in Atlanta, Ga., May 12. Mr. Virgil Powers presided, and Mr. T. E. Walker was Secretary.

A motion to make the rate of car mileage 0¼ cent per mile from May 1 to September 30 was defeated, and it was resolved to make the rate 0¾ cent per mile, loaded or empty, for the entire year. The following resolution was then adopted:

"With a view of arriving at a more satisfactory result in the conduct of the mileage business and the distribution of charges,

"*Resolved*, That the Chairman of the meeting draw up the outlines of a plan for forming an association or joint stock company of the same roads interested in the Green Line business, for owning the necessary cars for interchange traffic as common or joint property, and distributing the net revenue accruing from mileage among the owners *pro rata* according to interest, and to submit the same to the several managers, and to solicit their views as to the desirability for entering into the plan, and if favorable, to call a meeting of said managers for the purpose of agreeing upon details and putting the plan into execution."

A resolution was adopted that the chairman present to the Cincinnati Southern, the Norfolk & Western, and the Mobile & Ohio railroads the respectful request of this association for a compliance with the Green Line rules for reporting the daily movements of freight.

It was also resolved that the present demurrage system be abolished.

The meeting then adjourned.

New York State Canals.

For the week ending May 14, the tonnage of the New York state canals was 147,104 tons. Leading items of freight were 42,741 tons coal; 26,024 tons flour and grain; 11,883 tons iron ore and 10,215 tons stone and lime.

From the opening to May 14 the report is as follows:

	1882.	1881.
Miles of boats cleared	870,956	123,134
Tons freight	629,813	54,810
Tolls received	$73,206	$1,660

The canals opened for navigation April 16 this year and May 8 last year.

Continuous Tickets.

The following is the form of contract to be indorsed upon a continuous passenger ticket, to take the place of the old limited tickets, which has been prepared by the committee appointed at the last meeting of the National Association of General Passenger and Ticket Agents. Some alterations may possibly be made before the committee reports, but this is the form virtually agreed upon:

"In consideration of the reduced rates at which this ticket is sold, I, the undersigned, agree with the several companies over whose lines this ticket entitles me to be carried, as follows:

"1. That in selling this ticket the ..... Company acts as agent, and is not responsible beyond its own lines

"2. I agree that this ticket is not transferable, and no stop-over at an intermediate point will be allowed unless specially provided for by the local regulations of the lines over which it reads.

"3. I agree that any alteration whatever of this ticket renders it void.

"4. I agree that this ticket shall be valid for continuous passage only upon train leaving..... .....at.....m. of the date stamped upon this ticket, and upon the connecting trains of connecting lines that are run in continuous schedule between..... .....and.....

"5. I agree that any attempt to stop over, or to use any portion of this ticket otherwise than is herein provided, shall be a forfeiture of further right of passage under this contract, and that any railroad company or transportation line, whose line may constitute a part of the route over which this contract is made, may, in the event of such forfeiture, take up and redeem any unused remnant of this contract, by paying to the holder the difference between the price at which it is sold and regular first-class unlimited rates of fare over such portions of the route as may have been used.

"6. I agree that any railroad company forming part of route over which this ticket reads may take up the unused portions, or any part of them, and deliver instead a continuous passage check or ticket, securing to me the same rights and privileges as are secured by this ticket.

"7. I agree that the coupons constituting this ticket shall be void unless presented in connection with this contract, duly stamped, signed, and witnessed by the agent for the issuing company.

"8. I agree that I, the original purchaser, will sign my name and otherwise identify myself as such, whenever called upon to do so by any conductor or agent of the line or lines over which this ticket reads.

"9. I agree that baggage liability is limited to wearing apparel not exceeding $100 in value.

"10. I agree that my signature shall be in manuscript and in ink.

"11. I agree that unless all the conditions of this ticket are fully complied with it shall be void.

"12. I agree that I will not hold any of the lines named in this ticket liable for damages on account of any statement not in accordance with this contract, made by any employés of said lines.

"13. And it is especially agreed and understood by me that no agent or employé of any of the lines named in this ticket has any power to alter, modify or waive in any manner any of the conditions named in this contract.

"Signature.....

"Witness.....

"Date of sale.....188—"

THE SCRAP HEAP.

Locomotive Building.

The Ohio Central shops at Bucyrus, O., have just turned out a new locomotive, the first of five they are building; they are eight-wheel or American engines, with 17×24 in. cylinders, driving wheels 61 in. in diameter, the steel tires being 3 in. thick; they have 166 wrought iron tubes, 2 in. outside diameter, No. 12 wire gauge; boiler, fire-box, cross-heads, axles, piston-rods, crank-pins and rocker shafts all of steel. These shops were completed June 1, and tools all put in about Oct. 1 last, at which time the road had 30 engines, none of which had been in service less than a year, during which time no work had been done on them, owing to the want of shops. They have overhauled the most of

the locomotives, and kept up running repairs in addition to the new work. The order for the new engines was given Nov. 1, after which the boiler shop had to be built.

The Baldwin Locomotive Works, in Philadelphia, have just delivered 25 locomotives to the St. Paul, Minneapolis & Manitoba Railway. All were of the American type, with 17 by 24 in. cylinders. These engines were put through the different departments of the Baldwin Works in one block, and the entire 25 were finished and shipped in 12 working days, the first two going forward on Tuesday, May 2, and the last three on Monday, May 15. This would indicate a capacity of about 650 such locomotives a year.

The New York, Lake Erie & Western shops at Susquehanna, Pa., have just completed a new consolidation engine for the road. They are changing several engines from 6 ft. to standard gauge.

Car Notes.

The Laconia Car Co. at Laconia, N. H., heretofore owned by John C. Moulton and Perley Putnam, has been organized as a joint stock company, the change taking place May 1.

Work is progressing rapidly on the buildings of the North Carolina Car Co. at Raleigh, N. C. They will be ready for the machinery next month.

The Ensign Manufacturing Co. at Huntington, W. Va., is running on an order for cars for the Chesapeake & Ohio road.

The Cayuta Wheel & Foundry Co. at Waverly, N. Y., is making 3,000 car wheels a month, besides other castings.

The Canadian Pacific shops at Perth, Ont., are turning out three box cars a week, and will be able to turn out nine a week as soon as the additions now in progress are finished.

The Suspension Car Truck Manufacturing Co. is negotiating for a site for shops at South-Chicago.

Bridge Notes.

The Clinton Bridge Co., of Clinton, Ia., has just completed a bridge over the Brazos River at Waco., Tex., for the Texas & St. Louis road. The bridge has two shore spans of 55 ft. each, and three spans of 150 ft. each; the piers are composed of iron cylinders, filled with concrete. The short spans are Pratt combination, with stiff lower chords and wrought-iron details and the high spans, Warren girder combination with Howe truss bracing in the centre as far as the counter strains accrue, the design being original with the builders. The bridge was formally tested and accepted by the company recently, the long spans showing a deflection of 0¾ in. under one engine and 0⅞ in. under three engines coupled. The Clinton Bridge Co. is also building a bridge over the Maumee River at Toledo, and has other contracts in Wisconsin, Minnesota, Iowa and Texas.

The Mount Clare shops of the Baltimore & Ohio road, in Baltimore, are building four spans of iron bridge, 100 ft. each, to cross the Youghiogheny, on a new branch of the Pittsburgh Division; one span of 155 ft. across Turtle Creek on the Pittsburgh Division, and one of 130 ft. for the Central Ohio Division.

Alden & Lassig, of the Leighton Bridge & Iron Works in Rochester, N. Y., have taken contracts to build 11 bridges over street crossings on the New York Central's new elevated line through Rochester. Three other bridges were let to the Niagara Bridge Co., of Buffalo, N. Y., at the same time.

Mr. E. Darragh, having bought out the interest of his former partner, Michael Haviland, of Columbus, O., is now sole contractor for building the great stone viaduct at Minneapolis, for the St. Paul, Minneapolis & Manitoba road. Thirteen of the piers are now built above high-water mark, and all the piers will be up to that point by July 1. The contractor will have some of the centres up for the arches by June 1. The viaduct is to be entirely of solid masonry, arched.

The Louisville Bridge Co. is putting up an iron draw-span in the bridge over the Blackwater River in Florida, on the new Pensacola & Atlantic road.

The Pacific Bridge Co., of San Francisco, has taken the contract to build a draw-bridge over the Tuolumne River near Modesto, Cal. It is to cost $20,000.

Iron and Manufacturing Notes.

The New York Iron & Metal Exchange has been completely organized and its rooms at No. 69 Wall street were formally opened May 16. The officers are: President, James B. Brinsmade; Secretary and Treasurer, Edwin F. Bedell; Assistant Secretary, Wm. Allen Smith. The membership includes some of the strongest iron firms in the city.

T. New, of New York, reports that he has applied more than 50,000,000 square feet of his two and three-ply roofing felt, mostly to manufacturing establishments.

The Western Fence Co., of Chicago, has taken a contract for a considerable amount of barbed wire fencing for the Pittsburg, Cincinnati & St. Louis road. The fencing will be of large, sawed cedar posts and the Kelly pattern wire.

The Southwark Foundry & Machine Co. in Philadelphia is building a Porter-Allen engine of 1,300 horse-power for the Indianapolis Rolling Mill Company; one of 700 horse-power for the Logan Iron & Steel Co., and and a number of smaller engines of the same pattern.

The Phœnix Iron Co. at Trenton, N. J., has some large contracts for steam engines, roof-work, etc.

The stockholders of the Abbott Iron Co. in Baltimore will shortly consider the question of adding to their works plant for making steel rails and steel plate. The works are now running full time.

Furnace No. 3 of the Chestnut Hill Iron Ore Co. at Columbia, Pa., has been repaired, and will soon be put in blast.

The Franco-American Mining & Manufacturing Co. has been organized, with $503,000 capital stock, to build iron and steel works at Trois Rivières, P. Q., on the St. Lawrence River.

The Reading Bolt & Nut Works of J. H. Sternbergh, at Reading, Pa., have been enlarged by a rolling mill for making refined bars. It has a capacity of 9,000 tons a year.

Moselem Furnace in Berks County, Pa., went of blast a short time ago, and is now being thoroughly rebuilt.

The Rail Market.

For steel rails there is an active inquiry reported, especially for small lots for early delivery. Quotations are from $50 per ton at mill, seller's option, up to $52.50 for early delivery, but there are reports that $47.50 has been accepted for some sales. There is some inquiry for light rails, which are quoted $1 to $2 per ton higher.

For iron rails also there is a more active demand and a number of sales reported. Heavy sections are quoted at $44 per ton at mill; light rails from $46 upwards.

Spikes are quoted at $2.80 to $3 per 100 lbs., fish-plates, $2.50; track-bolts, $3.70 to $4.10.

No business is reported in steel blooms; quotations are $41 per ton in Philadelphia, duty paid.

Old iron rails are lower, but very little business is reported. Sales of small lots are reported at $26.50 per ton in Philadelphia for tees and $28 for double-heads. Lower prices are looked for. A sale of crop-ends is reported at $25 per ton in Philadelphia.

Engineering.

John Wiley's Sons, No. 15 Astor Place, New York, have been appointed agents for the London *Engineering* in the United States, and are prepared to receive subscriptions and advertisements for that journal.

Sale of Car Works.

The sale of the Bellefonte Car Works, at Bellefonte, Pa., which was to have taken place May 17, has been adjourned one week, to Wednesday, May 24.

Young Men's Christian Association, Railroad Branch.

At the International Convention held last year the following resolutions were adopted:

"*Resolved*, That instead of one International Conference of Railroad Branches of the Young Men's Christian Associations, more Christian railroad men can be reached and interested by holding conferences in different sections of the country.

"*Resolved*, That the International Committee be requested to arrange for and call such conferences at such times and places within the next two years as they shall deem best."

In accordance with these resolutions, a conference is held this week at St. Thomas, Ont., beginning Thursday, May 18, and closes on Sunday, May 21.

Another Conference will assemble at Springfield, Mass., at 4 p.m., Thursday, May 25, and close on Sunday, May 28.

Conferences for the West and South will be arranged for later.

Railroad branches of Young Men's Christian Association in Canada and in the Northern and Eastern portions of the United States are requested to send representatives to whichever of these conferences it may be most convenient for them to attend. Christian railroad officials and men from places where branches have not yet been organized will be specially welcome.

Prominent railroad officials, clergymen and association members have been invited and are expected to prepare papers upon various phases of the work, and to be present at the conferences.

Such a presentation of the work will be made as will be valuable to all who are interested in practical Christianity, and especially to all who are interested in railroads and the men who operate them.

Persons expecting to attend the conference at Springfield are requested to send their names as early as possible to Theodore F. Judd, General Secretary, Merrick P. O., West Springfield, Mass.

Fastenings for Bonded Cars.

In Washington, May 15, a committee of the Treasury Department officials opened bids for fastenings for cars and vessels transporting merchandise in bond and seals for cording and sealing. Bids were received from J. D. Whitmore & Co., of New York; W. F. Beasley, of Oxford, N. C.; A. B. Johnson, Nashville, Tenn.; E. J. Brooks, of New York, and E. B. Caton & Co., W. D. Colt, Charles Pelham and D. A. Towles, of the District of Columbia. The contract will not be awarded for some time yet.

OLD AND NEW ROADS.

Austin & Northwestern.—The track of this road is now laid for 60 miles from Austin, Tex., and General Manager H. W. McNeill announces the opening of this section for business. The last ten miles were laid in very short time, the object being to complete 60 miles by May 1. This was done, the company thereby securing $20,000, depot grounds and right of way from the city of Austin. The new road runs through a country now without a railroad, and will reach some valuable stone quarries. It also passes several points where large water-powers can be made.

Baltimore & Ohio.—In the suit between this company and the Pittsburgh, Cincinnati & St. Louis road over the 33 miles from Columbus, O., to Newark, used by both roads, the court has overruled a demurrer interposed, and holds that the two companies are tenants in common, and that a partition of the joint estate can be made. The demurrer being overruled, the case will come up on its merits.

Bath & Hammondsport.—We are informed that the gross earnings of this road (from Bath, N. Y., to Hammondsport, 9 miles) for the month of April are 82 per cent. in excess of the previous April, and for the six months ending with April 49½ per cent. in excess of the corresponding six months a year ago. This large increase at a season when only local business can be expected, and when many of the roads are complaining of a falling off, is a good indication of the growing sources of the road's business, which is largely in grapes and wine, Hammondsport being a centre of the vineyard and wine interest and the great grape-producing region of New York

Bradford, Eldred & Cuba.—The right of way for the extension of this road has been secured from Cuba, N. Y., to Clarksville Centre, and grading will soon be begun.

Buffalo, Cayuga Valley & Pine Creek.—This company has been organized, and surveys of the road are in progress. It is intended to be a narrow-gauge line to Buffalo, affording an outlet for the network of narrow-gauge roads which has sprung up in the Bradford and Allegheny oil districts.

Buffalo, Pittsburgh & Western.—The extension of this road from Irvineton, Pa., to Salamanca, 48 miles, was to be opened for business this week. The rails are all laid and everything in readiness. The depot arrangements in Salamanca are not completed, as there are several matters to be adjusted there with the New York, Pennsylvania & Ohio road, in relations to crossings and connections. It is believed, however, that these questions can be amicably settled.

On the new extension there are 42 miles of new road, the Philadelphia & Erie track being used from Irvineton to Warren, six miles.

California Southern.—During the month of April 21.15 miles of track were laid on this road, making the end of the track 108.31 miles northward from the starting point on San Diego Bay.

California papers report that arrangements have been made for the connection with the Southern Pacific at Colton, which will soon be reached.

Carolina Central.—The suit of Virginia B. Matthews against this company and others came up before the North Carolina Circuit Court at Goldsboro, May 12, on the motion for the appointment of a receiver. After some discussion the case was put over until July 11 next.

Central, of New Jersey.—Arguments were heard by the Chancellor at Newark, N. J., May 13, on the petition for a peremptory order for a meeting of stockholders and an election of directors. The Chancellor reserved his decision, which will probably be announced next week.

Chesapeake, Ohio & Southwestern.—The gauge of this road from Louisville, Ky., by Paducah to Dyersburg, Tenn., 317 miles, was to be changed from 5 ft. to 4 ft. 8½ in. this week.

There now remains a gap of 39 miles between the end of the Paducah Division at Dyersburg and the northern end of the Memphis Division at Covington. Work is in progress on this gap.

Chicago, Burlington & Quincy.—On the Denver extension of this company's road the tracklayers are now at work in the Sand Hills, 40 miles westward from the late terminus at Akron, Col., leaving about 60 miles to be finished to reach Denver. It is expected that the track will be completed to Denver by July, if no unforeseen delay occurs. The work through the Sand Hills is of some difficulty, on account of the light and shifting nature of the soil.

Chicago & Eastern Illinois.—The United States Supreme Court has consented to grant a rehearing on the appeal in which the Court recently decided that the foreclosure and sale, under which the Chicago, Danville & Vincennes road passed to this company, must be set aside.

Chicago, St. Louis & Western.—This company has been organized to build a railroad from the present terminus of the Chicago, Pekin & Southwestern road at the Mazon River, near Joliet, Ill., to a point on the Chicago & Western Indiana near Dolton. The distance is about 38 miles. The road is intended to give the Chicago, Pekin & Southwestern an independent line to Chicago.

Chippewa Valley & Superior.—The grading on this road from Eau Claire, Wis., southwest to the Mississippi opposite Wabasha is all completed except four miles, and the track has been laid to Durand, 35 miles from Eau Claire. The contractors expect to have the road finished next month.

Cincinnati, Columbus & Hocking Valley.—This road is now completed and trains are running regularly between Jeffersonville, O., on the Ohio Southern road, and Claysville Junction on the Little Miami road, a distance of 28 miles. The road is now of standard gauge, having been changed from 3 ft. this year.

Cincinnati, Wabash & Michigan.—Track is reported laid from the old terminus at Goshen, Ind., northwest to Niles, Mich., 28 miles. Work is progressing steadily on the extension from Niles north by west to Benton Harbor on Lake Michigan, about 24 miles.

Connotton Valley.—At the meeting in Canton, O., May 12, the purchase of the Connotton Valley & Straitsville road was ratified. Final action on the plan for the readjustment of the company's affairs was postponed until the next meeting of the board, with the expectation that the remaining securities will come into the agreement before that time.

Dakota, Wyoming & Western.—This company has been organized to build a railroad from the eastern line of Wyoming Territory to the Yellowstone National Park, with a branch from Hot Creek to Cheyenne, about 500 miles in all.

Des Moines & Fort Dodge.—Reports that the Minneapolis & St. Louis had leased the Des Moines & Fort Dodge road are untrue. A Des Moines dispatch says: "The Des Moines & Fort Dodge road will be extended to the Chicago, Milwaukee & St. Paul road this year. Beyond that point nothing is determined."

Ft. Wayne, LaFayette & St. Louis.—Surveys have been completed for this proposed road from Ft. Wayne, Ind., to Logansport, and contracts will soon be let for the grading. It will follow for the most part the line of the old canal, and will be parallel and close to the Wabash track all the way.

Gainesville & Dahlonega.—The directors of this company have resolved to issue $75,000 in bonds, and also to let contracts for the building of the road from Gainesville, Ga., to the Chestatee River near Leather Ford, about 15 miles.

Genesee Valley.—Tracklaying on this road is in progress from Mt. Morris, N. Y., southward. The work of ballasting is in progress between Rochester and Canawaugus. The contract for fencing the entire road has been let to Ferguson & Northrup, who have a similar contract on the New York, Lackawanna & Western.

Georgetown.—Surveys have been made for this road from Georgetown, S. C., westward to Lane's on the Northeastern road. The distance is 36 miles, and the estimated cost about $10,000 per mile.

Georgia Pacific.—Track is now laid to Douglasville, Ga., 26 miles westward from Atlanta. Regular trains will be put on this section this week. The line is graded five miles further, and work is progressing steadily.

Great Western and the Wabash.—Mr. Wm. Abbott, the London stock-broker who engineered the Great Western election in favor of the Grand Trunk, expressed himself as follows with regard to the relations between the Wabash and the Great Western entered into about a year ago when a London agency of the Wabash was established at the Great Western's office: "Not satisfied with treating with Mr. Vanderbilt as to his interests, and setting Mr. Vanderbilt against Mr. Gould, and Mr. Gould against Mr. Vanderbilt, the President of this company, associated with some of his directors, came in contact with Mr. Gould. Now, I think we have been able to form an opinion of Mr. Gould in this country, and I will tell you what my opinion of him is—that he is a unique specimen of a highly gifted and intelligent people. (Loud laughter and cheers.) I think there is one great mistake a man makes when he thinks he is clever. No doubt our President thinks he is certain of his ground, but when he comes in contact with a man like Mr. Jay Gould he is certain to have him, and he has had him. What did Mr. Jay Gould do to him? Mr. Jay Gould says, 'Now look here, Colonel Grey'—I can imagine that he would do it calmly, because he is one of those persons possessing a moral power of persuasion, and it is wonderful how he manages to get people into his clutches—'I have got this vast Wabash, and will make a communication with you, I will put over your line £10,000 of traffic per week, and so many thousand cars.' Fascinating! It was positively dazzling! (Laughter.) 'The tip was then circulated, buy Great Western shares of Canada at 16; be in time'—(laughter)—'we have made an agreement with the great Wabash.' (Hear, hear.) A gentleman says 'Hear, hear.' He is a sufferer no doubt. (Laughter.) Very well, that was not enough. Mr. Jay Gould did not get enough out of him then. So he says, 'I will tell you what I will do; I will make you the Great Western of Canada agents for this vast Wabash in England!' Just fancy the depth of that splendid offer. (Laughter.) He wanted an agent! He wanted a respectable company, and he could not single out anything better than the 4,000 conservative proprietors on the register of this company! (Loud cheers.) At this moment the name is painted up on the door of your office as agent, and I should strongly advise the new board to have it taken down. Does it look respectable for this company to do this? No doubt it answers Mr. Gould's purpose. Now, what did he do? Being